FAA Aviation Forecasts

Fiscal Years 1997-2008

U.S. Department of Transportation
Federal Aviation Administration

Office of Aviation Policy and Plans · Washington, DC 20591 · FAA-APO-97-1

Photo of Air Traffic Control Tower at Washington National Airport
Courtesy of MWAA/R.Latoff

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16. Abstract

This report contains the Fiscal Years 1997-2008 Federal Aviation Administration (FAA) forecasts of aviation activity at FAA facilities. These include airports with both FAA and contract control towers, air route traffic control centers, and flight service stations. Detailed forecasts were developed for the major users of the National Aviation System: air carriers, air taxi/commuters, general aviation, and military. The forecasts have been prepared to meet the budget and planning needs of the constituent units of the FAA and to provide information which can be used by State and local authorities, the aviation industry, and the general public.

The outlook for the 12-year forecast period is for moderate economic growth, declining real fuel prices, and modest inflation. Bases on these assumptions, aviation activity is forecast to increase by 17.0 percent at the combined FAA and contract towered airports (443 in 1996) and 24.6 percent at air route traffic control centers. The general aviation active fleet is forecast to increase by almost 8.4 percent while general aviation hours flown grow by almost 12.9 percent. U.S. scheduled domestic passenger enplanements are forecast to increase 61.3 percent--air carriers increasing 58.0 percent and regional/commuters growing by 85.9 percent. Total international passenger traffic between the United States and the rest of the world is projected to increase 93.7 percent. International passenger traffic carried on U.S. flag carriers is forecast to increase 95.8 percent.

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PREFACE

I am pleased to submit to the aviation community *FAA Aviation Forecasts, Fiscal Years 1997-2008*. These forecasts are developed annually by Robert L. Bowles and his staff in the Statistics and Forecast Branch for use by the agency in its planning and decision-making processes. In addition, these forecasts are used exclusively within aviation and transportation communities as the industry prepares for the future.

This year's report contains nine chapters which discuss three major areas: (1) the U.S. and world economic environment, assumptions, and predictions which are used in developing the forecasts; (2) historical data and forecasts of future aviation demand and aircraft activity for three major non-military user groups--large commercial air carriers, regional/commuter airlines, and general aviation/helicopters; and (3) workload measures for FAA and contract towers, en route centers, and flight service stations. The report concludes with a discussion of our forecast accuracy (which I am pleased to report has been very high in the short-term and quite reasonable over the longer term) and year-by-year historical data and forecasts for selected aviation demand and activity series.

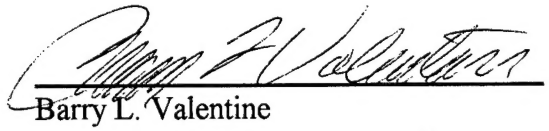
Briefly, the forecasts predict moderate expansion of both the U.S. economy and U.S. aviation demand and aircraft activity. Internationally, aviation is anticipated to grow more rapidly than in the United States, especially in the Pacific Rim and Latin America. I am also pleased to report that for the first time in addition to forecasts of international traffic for U.S. air carriers, this document also contains forecasts of total international passenger demand (U.S. and foreign flags) between the United States and three world travel regions--Atlantic, Pacific, and Latin America.

Based on the economic projections which are provided by the Executive Office of the President, Office of Management and Budget (through 2007) and by DRI/McGraw-Hill and The WEFA Group (2008), we expect real gross domestic product to grow at an average annual rate of 2.3 percent between 1997 and 2008. Higher increases are projected for many major foreign countries and regions (based solely on projections provided by The WEFA Group). Combining information on economic projections and industry assumptions with analysts' expertise results in an anticipated annual growth rate of 4.6 percent for revenue passenger miles for U.S. air carriers for the period 1997 to 2008. Annual domestic growth is expected to average 4.2 percent and annual international growth is projected to be 5.8 percent. Total international passenger traffic between the United States and the rest of the world is projected to average 5.7 percent annually.

In reading and using the information contained in this document, it is important to recognize that forecasting is not an exact science. Its accuracy is largely dependent on underlying economic and political assumptions. While this always introduces some degree of uncertainty, the range is, on average, relatively narrow.

Although there are slight differences between both the Administration's short- and long-term economic projections and those prepared by other economic forecasting services, the differences are in degree, not direction. In addition, future federal policy and programs may change. Such shifts could produce changes in either the short- and/or long-term economic outlook or both, and could significantly alter the demand for aviation services.

If in using this document you see opportunities for improvement, I would appreciate hearing from you. We welcome information and suggestions to improve the usefulness and accuracy of our forecasts and this document. You are encouraged to send your comments to me at the Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591.



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EXECUTIVE SUMMARY

U.S. Department of Transportation
Federal Aviation Administration

CHAPTER I

EXECUTIVE SUMMARY

THREE IN A ROW, AND COUNTING...

The commercial aviation industry recorded its third consecutive year of strong growth in fiscal year (FY) 1996. *(All stated years for U.S. economic, traffic, and financial data are in fiscal years; all international economic, traffic, and financial data are in calendar years [CY], unless otherwise noted.)* Growth in both domestic and international markets continue to be driven, in large part, by the continued expansion in the U.S. and world economies. However, growth in the domestic sector was also impacted positively by a lapse in the 10 percent U.S. ticket tax for eight months of 1996 (January 1 through August 27).

The U.S. economic expansion has recorded 22 consecutive quarters of growth, making it the third longest post-World War II expansion. Real growth in gross domestic product (GDP) (as measured in chain weighted 1992$) has averaged 2.5 percent annually since the 1990-91 recession. Over the past 3 years, real GDP has averaged 2.6 percent--up 3.2 percent in 1994, 2.6 percent in 1995, and slowing to 2.0 percent in 1996.

Globally, economic gains have averaged less than half that of the United States, increasing at an annual rate of only 1.3 percent during the 1990s. However, world GDP grew by 2.1 percent in 1995, and it is estimated that world economic activity will increase by 2.6 percent in 1996.

With the exception of the former Soviet Union (real GDP down 2.6 percent in 1996), most countries experienced moderate to strong economic activity in 1996. The fastest expanding world economies continue to be China (GDP up 9.5 percent) and the Pacific Basin countries (GDP up 6.8 percent). Recovery also appears to be well underway for two of last year's weakest economic performers--Mexico (GDP up 4.2 percent compared a decline of 6.2 percent in 1995) and Japan (up 3.8 percent compared to only 0.8 percent growth in 1995). Eastern Europe continued its economic turnaround (GDP up 4.6 percent), recording its third consecutive year of strong growth. The economies of Canada and Western Europe both slowed during 1996, with real GDP growing by only 1.4 and 1.6 percent, respectively.

The expanding U.S. and world economies have had a major impact on the demand for aviation services. U.S. commercial air carrier passenger enplanements, which had averaged less than 1.0 percent growth between 1993 and 1990, grew at an annual rate of 6.2 percent over the

last 3 years. U.S. commercial air carrier revenue passenger miles (RPMs) grew at an annual rate of 5.6 percent over the last 3 years.

Worldwide traffic demand also experienced relatively strong growth over the last 3 years. During the past 33 months (reported traffic through September 1996), the combined traffic of the U.S. majors and the carriers who make up the Association of European Airlines (AEA) and the Orient Airline Association (OAA) grew at an annual rate of nearly 8.6 percent. During this same 33-month period, the AEA member airlines' traffic increased at an average annual rate of 8.2 percent, while the OAA carriers' traffic averaged nearly 11.3 percent annually. The two Canadian flag airlines (Air Canada and Canadian) also experienced strong traffic gains during this period, with traffic growth averaging almost 9.4 percent annually. While U.S. airlines continue to report strong growth in traffic between the United States and Latin American destinations (up 8.6 percent annually since 1993), traffic for the three Latin American airlines (Aeromexico, Transbrazil, and Varig) for which reported data is available, continues to be disappointing. Since 1993, traffic growth for these three carriers has averaged only 1.5 percent annually.

The financial performance of commercial airlines has also shown considerable improvement over the last 3 years. Between 1990 and 1993, U.S. commercial airlines' cumulative operating losses totaled nearly $5 billion while its net losses totaled over $11 billion. However, over the last 3 years, the industry has reported cumulative operating profits of $13.8 billion and net profits of over $5.1 billion. In 1996, U.S. carriers reported operating profits of almost $6 billion and net profits of $2.7 billion, both records for a single year's financial performance.

Based on data compiled by the International Civil Aviation Organization (ICAO), world air carriers (including U.S. airlines) reported cumulative operating losses of $3.8 billion and net losses of $15.9 billion during the 3-year period between 1990 and 1992. However, over the next 3 years, world airlines reported cumulative operating profits totaling almost $25 billion, $14 billion in 1995 alone. There has also been some improvement in the world carriers' net position. Between 1990 and 1994, world air carriers reported cumulative net losses totaling over $20 billion. However, based on preliminary ICAO estimates, 1995 net profits could total $4.5 billion. Although financial data for the current year is incomplete, industry sources estimate that world carriers' operating and net profits could approach $17 billion and $5.5 billion, respectively, in 1996.

Despite a brief slowdown in 1995 (no growth in enplanements), the regional/commuter airline industry continues to be the fastest growing sector of the commercial aviation industry. Over the past three years, regional/commuter enplanemnts and RPMs grew at average annual rates of 7.2 and 11.2 percent, respectively. During the 1990s, regional/commuter passenger enplanements increased at a rate more than triple that of the larger jet carriers--up 79.1 percent compared to only 26.0 percent for the larger air carriers. More impressive, however, is the smaller carriers' growth in RPMs. During the same 7-year period, RPMs more than doubled, up 118.6 percent compared to 27.5 percent for the larger carriers.

The stronger growth in regional/commuter RPMs relative to enplanements reflects the increased trip length of the routes served by the smaller regional/commuter carriers. Since 1990, the average passenger trip length of the regionals/commuters has increased by almost 44 miles, from 179.6 miles in 1990 to 223.4 miles in 1996. The increase in the average passenger trip length is largely the result of two factors: (1) the transfer of large numbers of low-density, short-haul jet routes by the larger air carriers to its smaller code-sharing partners; and (2) the recent purchase and introduction of growing numbers of larger high-speed turboprop and regional jet aircraft which

are being utilized to serve an expanded market area.

The general aviation industry continues to exhibit the "new spirit" of optimism that was created by the passage of the General Aviation Revitalization Act in 1994. General aviation manufacturers are creating new jobs by reopening old product lines and/or establishing new product lines. In addition, manufacturers have once again begun to invest in research and development. The industry has also launched a number of industry-wide efforts whose main goal is to attract new pilots. That these efforts are having a positive impact is borne out by largely positive industry statistics. Unit shipments of general aviation aircraft are heading toward a second consecutive year of increases in 1996. In addition, the latest FAA General Aviation/Air Taxi Activity and Avionics Survey (GA Survey) also shows increases in both the number of active aircraft and hours flown.

REVIEW OF 1996

COMMERCIAL AVIATION

In 1996, the large U.S. air carriers increased their system capacity (available seat miles) by only 2.9 percent, while passenger demand (revenue passenger miles) increased by 6.1 percent. As a result, system-wide load factors (both domestic and international service) increased from 66.8 percent in 1995 to 68.8 percent in 1996--an all-time high. This marks the third consecutive year in which the industry has established a new record for passenger load factor.

Domestic capacity and traffic were up 3.1 and 6.6 percent, respectively, in 1996. As a result of the significantly slower grow in capacity during 1996, domestic carriers also established an all-time high load factor of 67.5 percent, eclipsing the previous high of 65.2 percent recorded in 1995.

As in 1995, much of the increase during the past year was the result of considerably stronger growth among the smaller nationals and regionals. During 1996, the majors traffic grew by 5.0 percent while the nationals/ regionals traffic increased 24.0 percent. During this same period, the majors capacity increased by only 2.4 percent compared to a 26.7 percent increase by the nationals/regionals.

There are, however, signs that the pendulum may be swinging back in favor of the larger majors. The unfortunate Valujet accident in May 1996 and subsequent grounding of the carrier, in combination with the financial problems of several other new entrants, appears to have slowed the growth of the low-cost, low-fare startup carriers. Over the last 5 months of the fiscal year (May to September), the majors' traffic increased at a rate of 8.1 percent compared to 7.2 percent for the smaller nationals/regionals In addition, these problems appear to have touched off a number of counterattacks and renewed competitive actions by the majors in an effort to regain lost market share..

In 1996, it is estimated that U.S. and foreign flag carriers transported a total of 94.8 million passengers between the United States and the rest of the world, an increase of 5.5 percent over 1995. This includes 38.5 million passengers (up 4.1 percent) between the United States and Atlantic destinations, 33.9 million (up 5.6 percent) between the United States and Latin American destinations, and 22.4 million (up 7.7 percent) between the United States and Pacific/Far East destinations.

International enplanements on U.S. flag carriers grew by 3.6 percent in 1996. The slower growth by U.S. air carriers relative to total international traffic is largely due to a second consecutive year of declining passenger traffic

(down 2.9 percent in 1996) on the Atlantic routes. U.S. air carrier passenger enplanements to the other two world travel areas were up 6.8 percent in 1996--up 6.7 percent to Pacific/ Far East destinations and 6.9 percent to Latin American destinations.

Strong traffic growth in 1996, combined with a continuation of the industry's restructuring/cost cutting programs, resulted in all-time record profits in 1996--a $6.0 billion operating profit and a $2.7 net profit. Similar or higher profits will be required over the next several years for the industry to finance replacement and new aircraft needed to accommodate future growth, and meet the federally mandated noise regulations.

Despite the significant gains reported in both industry traffic and profits over the last several years, considerable disparity continues to exist among the individual carriers. In 1996, all 12 U.S. majors (carriers with revenues exceeding $1 billion) reported positive earnings on their income statements, including operating profits of $5.6 billion and net profits of $2.6 billion. Operating profits for the majors ranged from a high of $1.1 billion (Northwest and United) to a low of $29.2 million (United Parcel) with five carriers accounting for more than three-quarters of the group's total earnings. However, several financial analysts continue to express concern regarding the continued financial viability of at least two of the majors.

While the smaller nationals (operating revenues between $100 million and $1 billion) and regionals (operating revenues less than $100 million) were able to outperform the larger majors in terms of traffic generation in 1996, smaller size was not, in itself, a guarantee of profitability. The combined operating profit of the 43 reporting smaller carriers totaled only $387.8 million in 1996, with 19 carriers reporting losses ranging from just over $1.3 million to $25.3 million.

New commercial aircraft orders totaled 1,048 (up 91.6 percent) in 1996, the third largest year in history. However, the 1996 total does not include the recently announced orders by American (103 orders and 527 options) and USAir (120 orders, 120 subject to reconfirmation, and 160 options) which occurred during the last quarter of calendar year 1996. Much of the increase in aircraft orders is due to the industry's vastly improved financial position.

On the other hand, deliveries of new aircraft totaled only 457 in 1996, a decline of 6.2 percent. The decline in new aircraft deliveries reflects, to a large extent, the industry's dismal financial performance during the early 1990s. This led to the implementation of numerous route rationalization and cost-cutting programs and very few orders for new aircraft.

Although the demand for narrowbody aircraft continues to outpace the demand for widebody aircraft--64.5 percent of total orders and 64.3 percent of total deliveries in 1996--this segment of the aircraft market has been heavily impacted by the industry's restructuring programs. Only 294 narrowbody aircraft were delivered in 1996, 9.5 percent fewer than delivered in 1995 and 52.1 percent fewer than delivered in 1992. However, the market for narrowbody aircraft, in particular, and all aircraft, in general, appears to have turned around in 1995 and 1996. There were 675 orders for narrowbody aircraft in 1996, a 71.6 percent increase over 1995 and more than triple depressed 1994 levels. There were also 372 orders for widebody aircraft in 1996, an increase of 143.1 percent.

The regional/commuter airline industry appears to have overcome the unfortunate events that plagued it for much of 1995. During 1996, regional/commuter RPMs and enplanements grew by 12.1 and 8.1 percent, respectively. Regionals/commuters, like the larger air carriers, also benefited positively from the lapse

of the 10 percent ticket tax during 8 months of 1996.

GENERAL AVIATION

As stated earlier, statistical measures for general aviation were generally positive in 1996. For the 12-month period ending September 30, 1996, general aviation aircraft manufacturers shipped a total of 1,093 aircraft, a 9.4 percent increase over shipments for the same 1995 period. More important, however, is the fact that the renewed interest shown in piston-powered aircraft in 1995 continued for a second consecutive year. Shipments of piston-powered aircraft totaled 577 in 1996, an increase of 4.3 percent. Also in 1996, the industry shipped a total of 285 turboprops (up 21.8 percent) and 231 turbojets (down 4.1 percent).

Billings for general aviation aircraft declined 9.4 percent in 1996, this following 3 consecutive years of increased sales. The decline in billings reflects a change in the mix of aircraft shipments--increasing numbers of generally lower-priced pistonpowered aircraft and declining numbers of generally higher-priced turbojets

Based on the results of the 1995 GA Survey, the active general aviation aircraft fleet increased for the first time since 1992. In addition, the number of hours flown by general aviation aircraft recorded its first increase since 1989. According to the survey, the active general aviation fleet totaled 181,341 on January 1, 1996, an increase of 6.3 percent over the 1994 estimate. These aircraft flew an estimated 25.5 million hours in CY 1995, an increase of 6.7 percent.

Despite a decline of 2.3 percent in the total number of active pilots (639,200) in 1996, there were some positive statistics with regard to the pilot population. First and foremost, the number of student pilots (101,300) increased 5.0 percent in 1996, the first recorded increase in this category since 1990. Student pilots are one of the key factors impacting the future direction of the general aviation industry. The increase that occurred in 1996 is certainly a good omen for the industry, showing that its industry-wide programs to attract new pilots is beginning to show positive results.

Increases were also registered in the air transport (123,900, up 5.5 percent) and glider pilot categories (11,200, up 31.7 percent) in 1996. However, the other pilot classifications did not fare as well. The number of private pilots (261,400) declined 8.0 percent, the number of commercial pilots (134,000), declined 3.4 percent, and the number of helicopter pilots (7,200) declined 17.2 percent.

The number of instrument rated pilots (298,800, down 1.2 percent) declined for a fourth consecutive year in 1996. However, the percentage of total active pilots holding instrument rated certificates was up for the seventh year in a row, reaching an all-time high of 46.7 percent in 1996.

During 1996, the number of general aviation aircraft handled at FAA en route centers increased for a fifth consecutive year. Although the increase in 1996 was relatively small (0.5 percent), this sustained positive trend appears to indicate that the long awaited turnaround in business corporate flying is underway.

FAA WORKLOAD

Unusually harsh winter storms resulted in the disruption and/or shut-down of operations at numerous airports during several months of FY 1996, thus negatively impacting activity counts at FAA air traffic facilities. During the

months of December and January, activity at combined FAA and contract towers declined 3.5 percent while activity at en route centers was down 1.9 percent. It is estimated that these winter storms could have reduced 1996 activity counts by as much as 0.5 percent.

FAA and Contract Towers

The combined activity at both FAA and contract towered airports totaled 61.8 million in 1996, a decline of 0.9 percent from 1995 combined operation counts. The decline in the combined tower counts was largely due to declines in both general aviation and military activity, down 1.9 and 2.4 percent, respectively. Commercial activity (the sum of air carrier and commuter/air taxi--24.0 million) at combined tower facilities was up 0.6 percent in 1996.

Operations at FAA air traffic control towers totaled 54.4 million in 1996, a decline of 6.2 percent from 1995 activity levels. Most of the decline in activity at FAA towered airports is due to the conversion of 34 airports to contract tower status during the year. In fact, over the past 2 years, a total of 96 airports have been converted to contract towers. The number of FAA towered airports declined from 402 in 1994 to 315 as of September 30, 1996. The number of contract towers totaled 128 as of the same date.

Instrument operations at the combined FAA and contract towers (46.8 million) declined 1.2 percent in 1996. Commercial instrument operations (25.6 million) remained unchanged from 1995, while noncommercial activity (21.2 million) declined 2.6 percent. Instrument operations at FAA towered airports (46.2 million) also declined during 1996, down 1.7 percent. However, these activity counts were also distorted by the conversion of FAA towers to contract tower status, although not to the same extent as were total operations at FAA towered airports. In 1996, less than 1.0 percent of all instrument operations occurred at contract towers. During this same period, contract towers accounted for nearly 12.0 percent of all activity at the 443 FAA and contract towers.

Centers

The number of Instrument Flight Rule (IFR) aircraft handled at FAA's air route traffic control centers (40.3 million) increased 0.7 percent in 1996, largely the result of a 9.6 percent decline in military activity. On the other hand, the number of commercial aircraft handled was up 2.4 percent. The number of general aviation aircraft handled also increased slightly in 1996.

SUMMARY

In summary, the impact of moderate to strong U.S. economic growth, in combination with the lapse in the 10 percent ticket tax for much of the year, resulted in relatively strong demand for commercial air services during 1996. A continuation of the industry's restructuring and cost-cutting measures led to significant improvements in the financial viability of the U.S. commercial aviation industry.

The results for the general aviation sector, although mixed, appear to reflect growing optimism within the general aviation community. Now into its third year since the passage of the General Aviation Revitalization Act, it appears that the industry has begun to move forward in revitalizing the market for general aviation products and services.

ECONOMIC FORECASTS

Gauging the timing, strength, and duration of the U.S. and world economic recovery continues to be a source of consternation for many economists and economic forecasting services. This task has been made even more difficult by the adoption by the Bureau of Economic Analysis of modified methods for estimating GDP--the chain-link weighting. *Because of these changes, the reader is cautioned against comparing GDP growth rates presented in this year's forecast document with those presented in earlier years.* A detailed discussion of the new chain weighted GDP is presented in Chapter II.

While there is generally widespread agreement among forecasters as to the general direction of the U.S. economy, there are small differences with regard to rates of growth between the forecasting services used by the FAA (DRI/McGraw-Hill and The WEFA Group) and the economic projections supplied by the Executive Office of the President, Office of Management and Budget (OMB). In general, OMB is somewhat more optimistic than are the two forecasting services (2.3 compared to 2.2 percent annual growth between 1996 and 2007).

The economic forecasts used to develop this year's FAA aviation forecasts anticipate moderate growth throughout the forecast period. In the short-term, U.S. economic activity is projected to increase by 2.4 percent in 1997, then slow to 2.0 percent growth in 1998 and 2.1 percent growth in 1999. Growth is expected to accelerate slightly over the remaining years of the forecast period, with GDP increasing at an average annual growth rate of 2.3 percent over the entire 12-year forecast period.

Worldwide economic growth is expected to greatly exceed that of the United States, increasing at an annual rate of 3.4 percent over the 12-year forecast period. Economic growth is forecast to be greatest in the Far East/Pacific Rim and Latin America, expanding at annual rates of 4.7 percent. Economic growth in Europe/Africa/Middle East countries is expected to average 2.7 percent over the forecast period.

Despite projections that show moderate to strong economic growth in Japan (up 2.6 percent in 1997), Mexico (up 3.8 percent), Eastern Europe (up 3.9 percent), and the former Soviet Union (up 5.7 percent), short-term economic and political uncertainties continue to cloud the economic outlook in these countries and could slow future aviation demand in these travel areas.

U.S. inflation (as measured by the consumer price index) is projected to remain in the moderate range throughout the 12-year forecast period, increasing at an average annual rate of 2.8 percent. Oil prices (as measured by the oil and gas deflator) are expected to increase by 3.1 percent in 1997, then decline by 5.9 percent in 1998 as Iraq increases its oil production and reenters the world oil market. Iraq's reentry and other oil producing nations' counteractions are expected to result in an oversupply of oil in 1998, thus driving down oil prices. However, oil prices are projected to increase at an average annual rate of 2.6 percent over the remainder of the forecast period, averaging 2.0 percent annually over the entire 12-year forecast period. In real dollars, fuel prices are forecast to decline by 0.8 percent annually. The forecast assumes no major disruptions in the price or availability of oil.

The projected growth of aviation demand discussed in subsequent chapters of this document is consistent with these national short- and long-term economic growth forecasts. Table I-1 on the following page summarizes the key economic assumptions used

TABLE I-1

FAA FORECAST ECONOMIC ASSUMPTIONS

FISCAL YEARS 1997-2008

ECONOMIC VARIABLE	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1990	1995	1996	1997	1998	2008	90-96	95-96	96-97	97-98	96-08
UNITED STATES											
Gross Domestic Product--Chain Weighted (In Billions of 1992$)	6,141.7	6,721.2	6,854.3	7,020.9	7,160.9	8,956.4	1.8	2.0	2.4	2.0	2.3
Consumer Price Index (1982-84 = 100)	129.0	148.8	153.0	157.3	161.4	211.9	2.9	2.8	2.8	2.6	2.8
Oil & Gas Deflator (1992 = 100)	98.7	101.2	104.3	107.5	101.2	132.1	0.9	3.1	3.1	(5.9)	2.0
INTERNATIONAL											
Gross Domestic Product (In Billions of U.S. 1990$)											
World	22,787.9	24,626.2	25,266.3	26,023.1	26,922.5	37,678.4	1.7	2.6	3.0	3.5	3.4
Europe*	8,486.3	9,254.5	9,422.5	9,657.3	9,926.3	13,000.6	1.8	1.8	2.5	2.8	2.7
Latin America/Mexico	1,056.6	1,253.7	1,295.0	1,355.0	1,421.4	2,255.9	3.4	3.3	4.6	4.9	4.7
Pacific**	4,816.3	5,809.0	6,112.5	6,376.5	6,692.2	10,662.7	4.1	5.2	4.3	5.0	4.7
EXCHANGE RATES											
(U.S.$/Local Currency)											
United Kingdom	1.818	1.577	1.553	1.567	1.512	1.463	(2.6)	(1.5)	0.9	(3.5)	(0.5)
Germany	0.669	0.699	0.665	0.637	0.617	0.633	(0.1)	(4.9)	(4.2)	(3.1)	(0.4)
Japan	6.924	10.639	9.224	9.050	8.969	9.992	4.9	(13.3)	(1.9)	(0.9)	0.7

Source: United States: FY 1997-2007; Executive Office of the President, Office of Management and Budget
FY 2008; Consensus growth rate of DRI/McGraw-Hill and The WEFA Group
International: CY-1997-2008, The WEFA Group

* Sum of GDP for Europe, Africa, and Middle East

** Sum of GDP for Japan, Pacific Basin, China, Other Asia, Australia, and New Zealand

in developing the aviation demand forecasts. The economic forecasts are discussed in detail in Chapter II and are presented in tabular form in Chapter IX, Tables 1 through 5.

It should be noted, however, that in any given year there is likely to be some perturbation around the long-term trend. None of the current econometric models is sufficiently precise to predict interim business cycles. In addition, unanticipated developments, such as the 1990 Iraqi invasion of Kuwait and subsequent Gulf War and run-up in oil prices, cannot be predicted at all.

AVIATION ACTIVITY FORECASTS

The FAA large commercial air carrier traffic and activity forecasts are summarized in Table I-2 on page I-11. Year-to-year historical and forecast data can be found in Chapter IX, Tables 6 through 18

The regional/commuter and general aviation traffic and activity forecasts are summarized in Tables I-3 on page I-13. Year-to-year regional/ commuter historical and forecast data can be found in Chapter IX, Tables 19 through 21; general aviation on Tables 22 through 26.

COMMERCIAL AVIATION

Although the current ticket expired on December 31, 1996, the consensus opinion is that the ticket tax will be reinstated at some point during fiscal year 1997. It should be noted, however, that the current air carrier and regional/commuter forecasts assume that the 10 percent ticket tax--or a like amount of user fees which are passed on to the passenger--will remain in effect throughout the entire 12-year forecast period.

Air Carriers

Domestic air carrier revenue passenger miles and passenger enplanements are forecast to increase at an annual rate of 4.2 and 3.9 percent, respectively, between 1997 and 2008. The forecast assumes relatively strong growth in 1997 with RPMs growing by 5.0 percent and enplanements increasing by 4.3 percent. Demand is expected to slow somewhat in 1998, with RPMs and enplanements increasing by 4.5 and 4.2 percent, respectively. While growth in these 2 years largely reflects the movement of the U.S. economy, traffic growth is also driven by the continued decline in domestic real yields, down 2.7 percent in 1997 and 2.5 percent in 1998.

These relatively large declines in real yield are based on the assumption that fares will remain constant in both 1997 and 1998. It is expected that domestic carriers will hold the line on fare increases in 1997 so as to negate the impact of the reinstatement of the 10 percent ticket tax on August 27, 1996. In addition, fare activity in 1997 and 1998 also reflects renewed competitive actions (both service and price) by the larger majors to counter the gains made by the low-cost, low-fare entrants.

Beginning in 1999, domestic yields are expected to increase by approximately 2.0 percent annually over the remaining 10 years of the forecast period. Over the entire 12-year forecast period, yields are projected to increase at an annual rate of 1.7 percent, with real yields declining at an average annual rate of 1.1 percent. The decline in real yields reflects the expected continuation of strong competitive forces (both domestically and internationally) throughout the forecast period. In addition, carriers are expected to continue to expand on

current restructuring and cost-cutting efforts. While increased competition exerts downward pressure on fare levels, the restructuring and cost cutting efforts allow the carriers to remain competitive without weakening the bottom line.

New to this year's forecast document are forecasts of total passenger traffic (U.S. and foreign flag carriers) between the United States and three world travel areas (Atlantic, Latin America, and the Pacific). Based on passenger statistics obtained from the United States Immigration and Naturalization Service (INS) and economic data (history and forecasts) provided by The WEFA Group, total passenger traffic between the United States and the rest of the world is projected to grow from 94.8 million in 1996 to 183.6 million in 2008, an average annual growth rate of 5.7 percent. Passenger traffic is expected to grow by an average 6.3 percent annually in the Pacific markets, 6.2 percent annually in the Latin American markets, and 4.7 percent annually in the Atlantic markets. A more detailed discussion of these forecasts can be found in Chapter III. The forecasts are presented in tabular form in Chapter IX, Table 10.

U.S. carrier international air carrier RPMs and passenger enplanements are both forecast to increase at annual rates of 5.8 percent over the 12-year forecast period. This stronger growth in international travel relative to that in domestic markets is, to a large extent, being driven by the strong demand projected in Pacific/Far East and Latin American markets--passenger enplanements up 6.5 and 6.3 percent, respectively. U.S. passenger enplanements in the Atlantic markets are projected to grow by 4.1 percent.

The U.S. air carrier fleet is projected to grow from 4,775 aircraft in 1996 to 7,226 in 2008, an increase of over 200 aircraft or 3.5 percent annually. In 2008, 17.9 percent of the fleet are projected to be widebody aircraft (1,295), up from 16.4 percent in 1996. The forecast assumes that U.S. air carriers will convert to an all stage-3 fleet (including retrofitted stage-2 aircraft) by the year 2000.

Air carrier aircraft operations are forecast to increase at an annual rate of 2.5 percent during the 12-year forecast period. The slower growth in activity at FAA air traffic facilities relative to expected traffic increases (domestic RPMs up 4.2 percent) reflects the efficiencies which result from the assumed increases in both the average aircraft size (up 23 seats) and the passenger trip length (up 27 miles). Only minimal efficiency gains are expected to be achieved from increased domestic passenger load factors. The current forecast assumes that load factors will remain fairly constant at the current historically high levels (68.0 percent) throughout the forecast period.

Regionals/Commuters

In 1996, the regional/commuter airlines enplaned 57.5 million passengers, 10.3 percent of all passenger traffic in scheduled domestic air service. By the year 2008, these carriers are expected to carry 106.9 million passengers (5.3 percent annual growth) and to account for 11.9 percent of all domestic passenger enplanements.

Regional/commuter airlines RPMs are expected to increase by 7.0 percent annually over the forecast period, growing from 12.8 billion in 1996 to 29.0 billion in 2008. The higher growth for passenger miles relative to enplanements is the result of expected large increases in the average trip length for regional/commuter passengers (up 48 miles). This is due, in large part, to the continued integration of large numbers of high-speed turboprops and regional jets into the regional/commuter fleets. These aircraft, with ranges of up to 1,000 miles, are expected to open up new opportunities for growth in nontraditional regional/commuter markets.

TABLE I-2

AVIATION ACTIVITY FORECASTS
LARGE AIR CARRIERS

FISCAL YEARS 1997-2008

AVIATION ACTIVITY	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1990	1995	1996	1997	1998	2008	90-96	95-96	96-97	97-98	96-08
U.S. Air Carriers											
Enplanements (Millions)											
Domestic	424.1	496.3	523.6	546.2	569.4	827.1	3.6	5.5	4.3	4.2	3.9
International	41.3	48.6	50.3	53.1	56.1	98.5	3.3	3.5	5.5	5.7	5.8
Atlantic	16.1	16.2	15.8	16.2	16.6	25.7	(0.3)	(2.9)	2.5	2.6	4.1
Latin America	13.0	18.0	19.2	20.7	22.2	40.2	6.7	6.9	7.7	7.2	6.3
Pacific	12.2	14.3	15.3	16.2	17.3	32.6	3.8	6.7	5.9	6.8	6.5
System	465.4	544.9	573.9	599.3	625.5	925.6	3.6	5.3	4.4	4.4	4.1
RPMs (Billions)											
Domestic	339.2	392.5	418.6	439.5	459.3	683.7	3.6	6.6	5.0	4.5	4.2
International	115.1	144.4	151.1	159.4	168.3	297.6	4.6	4.6	5.5	5.6	5.8
Atlantic	53.7	64.4	64.7	66.7	68.7	107.7	3.2	0.5	3.0	3.0	4.3
Latin America	16.0	24.4	26.6	28.9	31.3	58.7	8.9	8.9	8.6	8.3	6.8
Pacific	45.4	55.5	59.7	63.8	68.3	131.2	4.7	7.6	6.9	7.1	6.8
System	454.3	536.9	569.7	598.9	627.6	981.3	3.8	6.1	5.1	4.8	4.6
Fleet (As of January 1)	4,007	4,605	4,775	4,916	5,069	7,226	3.0	3.7	3.0	3.1	3.5
Hours Flown (Millions)	10.5	12.0	12.3	12.7	13.0	19.3	2.7	2.5	3.3	2.4	3.8
U. S./Foreign Flag Carriers											
Total Passengers to/from											
United States (Millions)	70.4	89.9	94.8	100.4	106.7	183.6	5.1	5.5	5.9	6.3	5.7
Atlantic	29.0	37.0	38.5	40.4	42.5	66.7	4.8	4.1	4.9	5.2	4.7
Latin America	26.3	32.1	33.9	36.2	38.7	70.1	4.3	5.6	6.8	6.9	6.2
Pacific	15.1	20.8	22.4	23.8	25.5	46.8	6.8	7.7	6.3	7.1	6.3

Source: 1990-96; U.S. Air Carriers, BTS Form 41, U. S. Department of Transportation
1990-95; Total Passengers, INS Form I-92, U.S. Department of Commerce
1997-2008; FAA Forecasts

The regional/commuter fleet is projected to increase from 2,090 aircraft in 1996 to 2,909 in 2008, an annual increase of almost 70 aircraft or 2.8 percent annually. Most of the growth in the regional fleet occurs in the larger aircraft categories. In 2008, 68.0 percent of the fleet is forecast to have seating capacity of 20 or more seats, up from 41.8 percent in 1996.

The move to greater use of small regional jets and larger, propeller-driven aircraft results in the average seating capacity of the regional fleet increasing from 30.5 seats in 1996 to 38.1 seats in 2008. The move to regional jets also results in the higher load factors over the forecast period, increasing from 52.1 percent in 1996 to 56.6 percent in 2008.

GENERAL AVIATION

The current forecast assumes increased business use of general aviation aircraft. This is largely reflected in the changing character of the general aviation fleet. The more expensive and sophisticated turbine-powered fixed wing fleet is expected to grow somewhat faster than the piston aircraft categories. There were an estimated 9,107 turbine-powered aircraft in the fixed wing fleet in 1996 (all years for general aviation fleet are as of January 1)--5.9 percent of the total fixed wing fleet (154,562). By 2008, it is projected that there will be 10,600 turbine-powered aircraft--6.3 percent of the total fixed wing fleet (167,500). Similarly, there were 3,643 turbine-powered rotorcraft in 1996--71.2 percent of the total helicopter fleet. Although the turbine-powered rotorcraft fleet is projected to remain constant through 2008, its share of the total rotorcraft fleet is projected to increase to 75.0 percent.

The general aviation piston fleet (145,454) is projected to increase only marginally in 1997, then grow by almost 1,000 aircraft annually over the remaining 11 years of the forecast period, totaling 156,900 aircraft in 2008. The number of single engine piston aircraft is expected to increase from 128,804 in 1996 to 139,500 in 1998, while the multi-engine piston aircraft fleet is projected to total 17,500 in 2008, up from 16,594 in 1996.

FAA WORKLOAD FORECASTS

The FAA forecasting process is a continuous one that requires the FAA's Statistics and Forecast Branch to interact with various FAA offices and services, other Government agencies (U.S. and foreign), and aviation industry groups, including discussions with commercial airlines and aircraft/engine manufacturers. In addition, the process uses a number of different economic and aviation data bases, the outputs of several econometric models and equations, and several other analytical techniques. The resultant FAA workload measures are used by the agency for manpower staffing and facility planning. The data and forecast process are discussed in more detail in Chapter VIII

The number of FAA towered airports declined from 402 in 1994 to 315 in 1996 (as of September 30) and is expected to total only 275 by September 30, 1998. During this same period, the number of FAA contract towers grew from 32 in 1994 to 128 in 1996 (as of September 30) and is expected to total 168 by September 30, 1998. The removal of 87 towers from FAA air traffic counts between 1994 and 1996 and the expected conversion of an additional 40 over the first 2 years of the forecast period, makes comparisons to previous year's activity counts and forecasts difficult, if not impossible. To overcome these reporting inconsistencies, the FAA has developed separate activity forecasts for both FAA and contract towered airports. Activity at FAA Air Route Traffic Control Centers and Flight

TABLE I-3

AVIATION ACTIVITY FORECASTS
REGIONAL/COMMUTERS AND GENERAL AVIATION

FISCAL YEARS 1997-2008

AVIATION ACTIVITY	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1990	1995	1996	1997	1998	2008	90-96	95-96	96-97	97-98	96-08
REGIONAL/COMMUTERS											
Enplanements (Millions)	37.2	53.2	57.5	62.5	65.9	106.9	7.5	8.1	8.7	5.4	5.3
RPMs (Billions)	6.7	11.5	12.8	14.2	15.2	29.0	11.5	12.1	10.5	7.3	7.0
Fleet (As of January 1)	1,819	2,132	2,090	2,148	2,217	2,909	2.3	(2.0)	2.8	3.2	2.8
Hours Flown	2.7	2.8	2.4	2.8	2.8	3.4	(2.0)	(13.8)	15.0	2.3	3.0
GENERAL AVIATION											
Active Fleet (000)											
(As of January 1)	197.8	170.6	181.3	181.8	184.1	196.6	(1.4)	6.3	0.3	1.3	0.7
Pistons	175.3	138.9	145.5	145.6	147.4	156.9	(3.1)	4.8	0.1	1.2	0.6
Turboprops/Turbojets	9.3	8.3	9.1	9.2	9.4	10.6	(0.4)	9.6	1.1	2.2	1.3
Rotorcraft	6.3	4.4	5.1	5.1	5.1	4.8	(3.5)	15.9	0.0	0.0	(0.5)
Hours Flown (Millions)	30.8	25.4	25.6	25.8	26.3	28.9	(3.0)	0.8	0.8	1.9	1.0
Pistons	25.8	18.9	18.9	19.1	19.4	20.9	(5.1)	0.0	1.1	1.6	0.8
Turboprops/Turbojets	3.7	2.7	2.9	2.9	3.0	3.7	(4.0)	7.4	0.0	3.4	2.1
Rotorcraft	2.2	2.3	2.3	2.3	2.3	2.5	0.7	0.0	0.0	0.0	0.7

Source: 1990-96; BTS Forms 298-C and 41, U.S. Department of Transportation; FAA Data
1997-2008; FAA Forecasts

Service Stations are not affected by the tower conversions.

Summary forecasts of aircraft activity at combined FAA and contract tower facilities can be found in Table I-3 on page 15. Summary forecasts of activity at FAA facilities *only*, including en route and flight service stations, can be found in Table I-4 on page 16. More detailed discussion of aircraft activity at both FAA and contract facilities can be found in Chapter VII. Year-to-year historical and forecast data can be found in Chapter IX, Tables 28 through 45.

FAA AND CONTRACT TOWERS

Activity at the combined FAA and contract towered airports is projected to grow from 61.8 million operations in 1996 to 72.3 million in 2008, an increase of 1.3 percent annually. The majority of this growth is expected to be the result of increased commercial aircraft activity, which is forecast to increase from 24.0 million operations in 1996 to 31.5 million in 2008, an increase of 2.3 percent annually.

General aviation activity is projected to increase from 35.2 to 38.4 million over the 12-year forecast period, an increase of 0.7 percent annually. Military activity is expected to decline from 2.6 million in 1996 to 2.4 million in 1998 and then remain constant at this activity level throughout the remainder of the forecast period.

The increased use of avionics by regional/ commuter airlines and general aviation aircraft, combined with the implementation of additional airport radar service areas, is expected to result in instrument operations increasing at a somewhat faster rate than total tower operations. Combined instrument operations counts at FAA and contract towered airports increase from 46.8 million in 1996 to 56.7 million in 2008, an annual increase of 1.6 percent.

Commercial aircraft activity is forecast to increase at a significantly faster rate than is noncommercial aircraft activity (the sum of general aviation and military). Forecast growth rates for commercial and noncommercial activity during the 12-year period are as follows:

- 2.3 versus 0.6 percent at combined FAA and contract towered airports; and
- 2.3 versus 0.7 percent for instrument operations at combined FAA and contract towered airports.

CENTERS

The workload at the air route traffic control centers is forecast to increase at an average annual rate of 1.8 percent during the 12-year forecast period. In 2008, FAA en route centers are expected to handle 50.2 million IFR aircraft, up from 40.3 million in 1996.

The higher growth at en route centers, relative to activity at towered airports, reflects the fact that commercial activity accounts for a significantly larger percentage of center activity (70.5 versus 38.8 percent at towered airports in 1996). Therefore, the projected increases in commercial aircraft activity (2.4 percent annually compared to 0.4 percent for noncommercial activity), is expected to have a much greater impact on total center traffic during the forecast period.

TABLE I-4

WORK LOAD FORECASTS
COMBINED FAA AND CONTRACT TOWERS

FISCAL YEARS 1997-2008

ACTIVITY MEASURES (In Millions)	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1990	1995	1996	1997	1998	2008	90-96	95-96	96-97	97-98	96-08
NUMBER OF TOWERS											
FAA Towers	403	352	315	295	275	275					
FAA Contract Towers	24	94	128	148	168	168					
TOTAL	427	446	443	443	443	443					
AIRCRAFT OPERATIONS											
Air Carrier	12.9	13.6	13.9	14.3	14.6	18.6	1.3	1.8	3.0	2.1	2.5
Commuter/Air Taxi	9.0	10.2	10.1	10.4	10.6	12.9	2.1	(0.8)	2.5	1.9	2.0
General Aviation	40.4	35.9	35.2	35.5	35.8	38.4	(2.3)	(1.9)	0.7	0.8	0.7
Military	2.9	2.6	2.6	2.5	2.4	2.4	(2.1)	(2.4)	(2.0)	(4.0)	(0.5)
TOTAL	65.2	62.4	61.8	62.7	63.4	72.3	(0.9)	(0.9)	1.4	1.1	1.3
INSTRUMENT OPERATIONS											
Air Carrier	14.0	14.7	14.8	15.2	15.5	19.9	0.9	0.7	3.0	2.0	2.5
Commuter/Air Taxi	9.5	10.9	10.8	11.0	11.3	13.8	2.3	(0.9)	1.6	2.7	2.0
General Aviation	19.2	18.2	17.9	18.0	18.3	19.9	(1.2)	(1.7)	0.5	1.7	0.9
Military	4.4	3.6	3.3	3.2	3.1	3.1	(4.7)	(7.1)	(3.5)	(3.1)	(0.6)
TOTAL	47.1	47.4	46.8	47.4	48.2	56.7	(0.1)	(1.2)	1.3	1.7	1.6

Source: FY 1990-2008, FAA Data and Forecasts

TABLE I-5

WORKLOAD FORECASTS
FAA FACILITIES

FISCAL YEARS 1997-2008

ACTIVITY FORECASTS (In Millions)	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1990	1995	1996	1997	1998	2008	90-96	95-96	96-97	97-98	96-08
AIRCRAFT OPERATIONS											
Air Carrier	12.9	13.6	13.8	14.1	14.4	18.4	1.1	1.2	2.5	2.1	2.5
Commuter/Air Taxi	8.8	9.8	9.3	9.2	9.2	11.1	0.8	(5.4)	(1.0)	0.0	1.5
General Aviation	39.2	32.3	29.2	27.5	26.7	28.0	(4.8)	(9.4)	(6.0)	(2.9)	(0.4)
Military	2.8	2.3	2.1	2.0	1.8	1.8	(4.8)	(9.2)	(4.0)	(10.0)	(1.2)
TOTAL	63.7	58.0	54.4	52.8	52.1	59.3	(2.6)	(6.2)	(2.9)	(1.3)	0.7
INSTRUMENT OPERATIONS											
Air Carrier	14.0	14.6	14.7	15.1	15.4	19.7	0.8	0.3	2.9	2.0	2.5
Commuter/Air Taxi	9.4	10.8	10.6	10.7	10.9	13.3	2.0	(1.7)	1.1	1.9	1.9
General Aviation	19.1	18.1	17.7	17.8	18.0	19.6	(1.2)	(2.1)	0.5	1.1	0.8
Military	4.4	3.5	3.3	3.2	3.1	3.1	(4.8)	(7.5)	(2.3)	(3.1)	(0.5)
TOTAL	46.9	47.0	46.2	46.8	47.4	55.7	(0.2)	(1.7)	1.2	1.3	1.6
IFR AIRCRAFT HANDLED											
Air Carrier	18.5	20.9	21.9	22.4	23.0	29.2	2.9	4.5	2.3	2.7	2.4
Commuter/Air Taxi	5.7	6.9	6.6	6.9	7.1	8.6	2.7	(4.1)	3.9	2.9	2.2
General Aviation	7.8	7.8	7.8	7.9	8.1	8.8	0.0	0.5	0.8	2.5	1.0
Military	5.5	4.4	4.0	3.7	3.6	3.6	(5.4)	(9.6)	(6.3)	(2.7)	(0.8)
TOTAL	37.5	40.0	40.3	40.9	41.8	50.2	1.2	0.7	1.4	2.2	1.8
FLIGHT SERVICES											
Pilot Briefs	11.8	9.2	8.4	8.2	8.0	7.6	(5.5)	(8.7)	(2.4)	(2.4)	(0.8)
Flight Plans Originated	7.3	6.3	6.4	6.4	6.3	5.9	(2.2)	1.6	0.0	(1.6)	(0.7)
Aircraft Contacted	6.3	4.2	3.8	3.6	3.4	3.0	(8.1)	(9.5)	(5.3)	(5.6)	(2.0)
TOTAL	44.5	35.2	33.4	32.8	32.0	30.0	(4.7)	(5.1)	(1.8)	(2.4)	(0.9)
DUATS	3.0	11.4	12.0	12.6	13.2	18.8	26.0	5.3	5.0	4.8	3.8
TOTAL (w/DUATS)	47.5	46.6	45.4	45.4	45.2	48.8	(0.8)	(2.6)	0.0	(0.4)	0.6

Source: FY 1990-2008, FAA Data and Forecasts

SUMMARY

The forecasts contained in this document assume that commercial air carriers and the general aviation industry will continue to benefit from the moderate to strong economic growth expected to take place both within the United States (GDP up 2.3 percent annually) and worldwide (GDP up 3.4 percent annually). U.S. air carrier passenger enplanements are forecast to increase by 4.1 percent annually--3.9 percent in domestic markets and 5.8 percent in international markets. Total international passenger traffic (U.S. and foreign flag) between the United States and the rest of the world is projected to increase by 5.7 percent annually, with higher growth occurring in the Pacific and Latin American travel markets.

It is also assumed that U.S. carriers will be joined by their foreign flag counterparts in restructuring and cost-cutting efforts, thereby improving the industry's overall financial performance. The retirement of large numbers of stage-2 aircraft during the 1997 to 2000 time period and their replacement by more fuel efficient stage-3 aircraft is expected to result in increased industry productivity. These productivity improvements are expected to strengthen the industry's overall financial performance.

Regional/commuter passenger traffic is expected to continue to increase at rates significantly higher than the rates projected for the larger air carriers (enplanements up 5.3 percent compared 3.9 percent). While regional/commuter carriers will continue to benefit from continued route rationalization by the large commercial carriers, it is not expected that this will be as significant driver of future growth as in the past. The move to larger high-speed turboprops and regional jets are expected to provide opportunities for growth from nontraditional regional/commuter markets.

The "new spirit" of optimism currently being exhibited throughout the general aviation community is expected to result in increased demand for general aviation products and services. The general aviation active fleet is expected to increase by over 15,000 aircraft (0.7 percent annually) while the number of hours flown is projected to increase by 1.0 percent annually over the forecast period. The business component of general aviation is expected to achieve somewhat greater growth than that forecast for the general aviation pleasure sector.

Aviation activity at FAA and contract facilities is expected to grow at a slower rate than that forecast for the general economy (1.3 to 1.8 percent versus 2.3 percent). This is due, in part, to projections which show relatively slow growth in general aviation activity (up 0.7 to 1.0 percent) and declining military activity (down 0.5 to 0.8 percent). In addition, increased efficiencies achieved by commercial air carriers and regionals/commuters through the use of larger aircraft and higher passenger load factors results in commercial activity levels lower than the projected growth in passenger traffic.

A relatively large part of the growth forecast in activity at FAA facilities is expected to come from the commercial sector--2.3 to 2.4 percent compared to 0.4 to 0.7 percent for combined general aviation and military activity. Commuter/air taxi activity has historically exceeded that of the larger commercial air carriers. However, with the expected move toward greater use of larger regional turboprops and turbojets and the resultant longer passenger trip lengths and higher load factors, commuter/air taxi aircraft activity is projected to grow at rates somewhat less than that forecast for the larger commercial air carriers.

While current economic forecasts presage a continuation of the current rebound in both the commercial and general aviation industries,

there are a number of uncertainties that could potentially limit the growth of the U.S. economy and ultimately, the demand for aviation services.

Corporate downsizing and/or the automation of operations has resulted in the elimination of numerous middle management positions, thus effectively reducing the base of both current and future business travelers. In addition, continuing technological improvements in communications, including advances in teleconferencing and facsimile mail, also have the potential to impact future business travel.

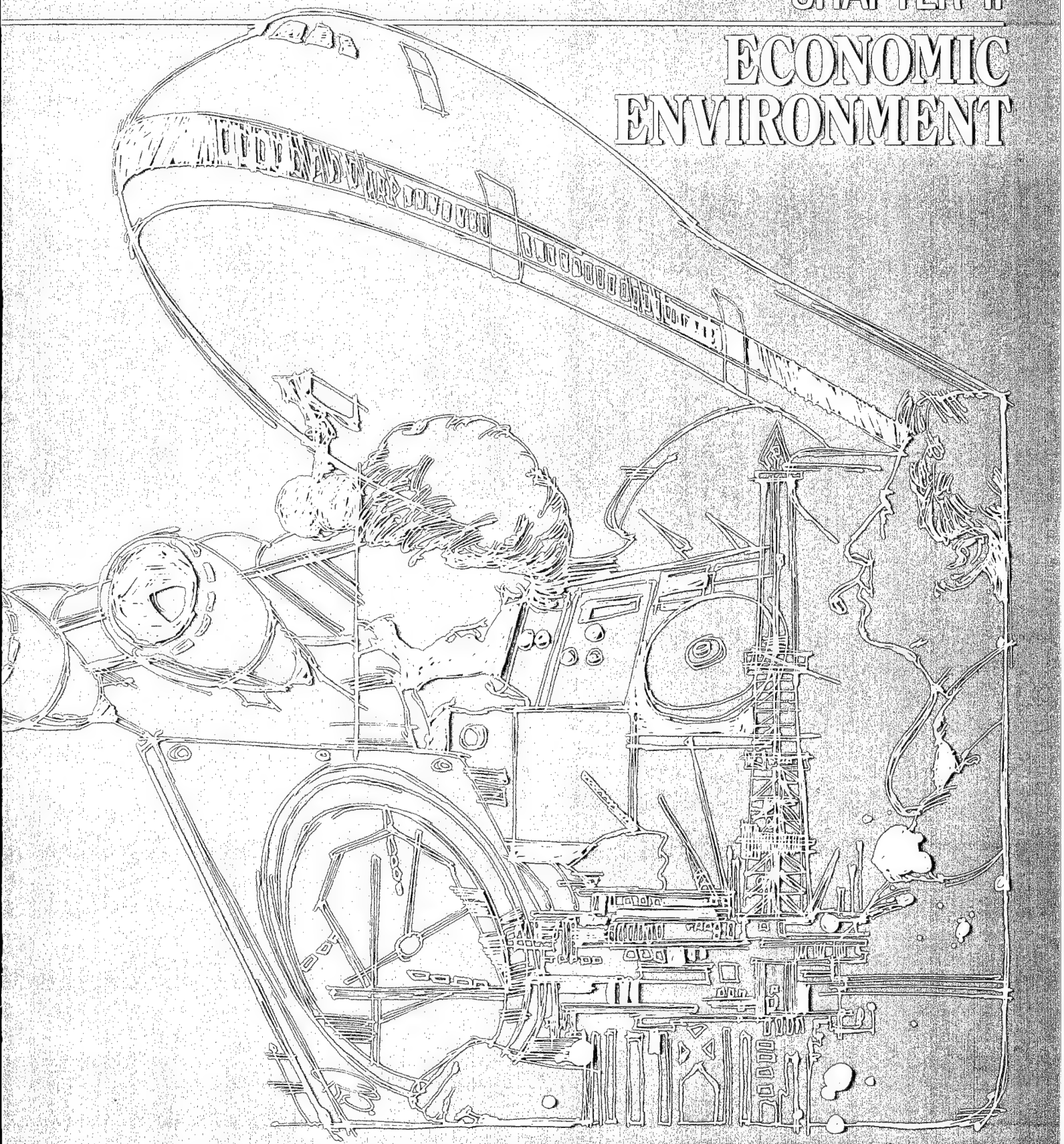
There are also several trends that have the potential to impact discretionary or pleasure travel. The continuing rise in consumer installment credit, which has led to increased personal bankruptcies and credit card delinquency rates, could reduce consumer spending, including travel expenditures, in 1997 and beyond.

Of more serious and lasting concern is the stagnation of middle-class incomes and the growing inequality in income distribution. The erosion of middle-class purchasing power has the potential to significantly impede the future growth of personal air travel.

Nevertheless, air transportation is expected to continue to dominate all other transportation modes in both long distance domestic intercity travel and in international passenger markets.

CHAPTER II

ECONOMIC ENVIRONMENT



CHAPTER II

ECONOMIC ENVIRONMENT

REVIEW OF 1996

The historical data used to project aviation demand and discussed in this chapter are derived from a number of sources. United States economic data is derived from annual and quarterly data supplied by the Office of Management and Budget (OMB), the Council of Economic Advisors, and two economic forecasting services--The WEFA Group and DRI McGraw-Hill. Quarterly estimates of three data series used to develop the aviation demand forecasts--Gross Domestic Product (GDP), Consumer Price Index (CPI), and the Oil and Gas Deflator--are annualized rates. Fiscal year estimates are calculated by averaging the four quarters of the fiscal year (October through September). Annual international economic data are derived from publications produced by The WEFA Group.

It should be noted that the specified years for the economic data discussed in this chapter are as follows: United States economic data is on a fiscal year (FY) basis and international economic data is on a calendar year (CY) basis, unless designated otherwise.

UNITED STATES

The current U.S. economic expansion is now into its sixth year, making it the third longest post-World War II expansion. Although the U.S. economy slowed considerably during the first quarter of 1996 (October to December, up only 0.3 percent), economic activity expanded more rapidly during the latter quarters of the year, growing at rates of 2.0, 4.7, and 2.0 percent, respectively. A sharp decline in consumer expenditures, which accounts for nearly two-thirds of GDP, caused the sharp decline in growth registered between the third and fourth quarter of 1996. Exports also slipped somewhat during the fourth quarter, although a surge in inventory accumulation cushioned the decline somewhat. For the year as a whole, U.S. GDP expanded by 2.0 percent compared to growth of 2.5 percent in 1995.

The inflation rate, as measured by the consumer price index, rose at a 2.8 percent pace in 1996, the same as in 1995. Fuel prices, as measured by the oil and gas price deflator, rose 3.5 percent in 1996, up considerably from a rise of only 1.3 percent in 1995.

The unemployment rate fell from 5.6 percent in the first quarter of 1996 to 5.2 percent in the last quarter. Nonfarm employment rose at annual rates of 1.7 and 1.8 percent during the first two quarters, somewhat lower than the increases of 2.7 and 2.3 percent recorded during the first two quarters of the year.

U.S. GDP is increasing at near its long-term rate of 2.3 percent. The Federal Reserve Bank (FED) has not intervened in the money markets since early 1996. At this time, experts do not foresee any immediate movement by the FED to either raise or lower interest rates, although some expect the FED to cut interest rates toward the middle of 1997.

WORLD

World-wide GDP expanded 2.6 percent in 1996, up from 2.2 percent in 1995. With the exception of the former Soviet Union, all of the world's developed nations reported increased economic activity in 1996. The developing economy of China reported the highest output growth, with a 9.5 percent gain for the year.

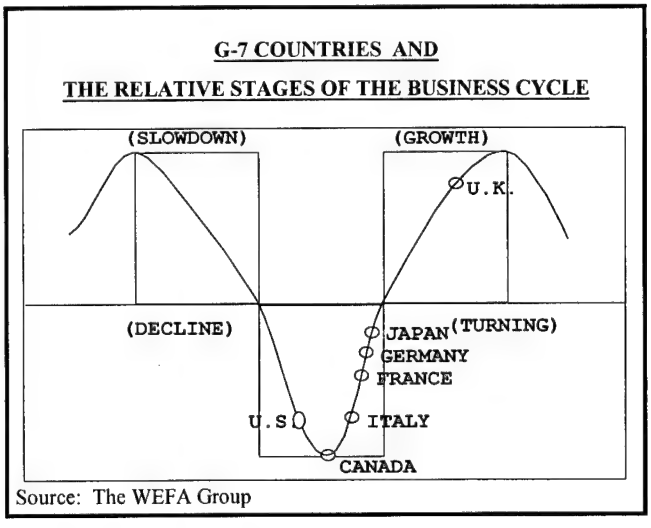
Asia continues to lead the world in economic growth. The Pacific Basin--Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan, and Thailand--reported GDP growth of 6.8 percent in 1996, second only to China among other regions in the world. Two other Asian countries, India and Pakistan, reported GDP growth of 6.4 percent in 1996.

The developing world nations of Africa and Latin America reported economic growth of 4.4 and 3.0 percent, respectively, in 1996. Eastern Europe's GDP also grew at a respectable rate of 4.6 percent.

Among developed nations, the Western European countries reported combined economic growth of 1.6 percent, substantially lower than the 2.6 percent growth of a year earlier. Australia and New Zealand reported growth rates of 3.6 and 2.3 percent, respectively.

Mexico, coming out of a deep economic slump, reported the highest growth rate (4.2 percent) among North American countries. Canadian GDP grew by 1.4 percent in 1996, nearly a percentage point lower than the 2.3 percent recorded a year earlier.

The G-7 nations--United States, Canada, United Kingdom, Germany, Italy, France, and Japan--differ significantly in their phase of the economic cycle. Japan, after suffering a prolonged recessionary period, is approaching the growth phase of its economic cycle. Real GDP in Japan grew 3.8 percent in 1996. Germany, Italy, and France remain in the recovery phases of their cycles as real GDP grew at rates of 1.2, 0.8, and 1.0 percent, respectively. The Canadian and U.S. economies, although experiencing positive GDP growth, find themselves near the bottom of the decline stage of their cycles. The United Kingdom is nearing the top of its growth phase, reporting GDP growth of 2.1 percent in 1996. The following graphic provided by The WEFA Group depicts the economic cycle of the G-7 nations.



Source: The WEFA Group

The lack of significant price inflation continued to bless the major industrialized countries in 1996. Italy, with a 3.9 percent increase in prices, had the highest inflation rate among the G-7 countries. Japan, on the other hand, reported the lowest inflation rate, 0.1 percent. Other G-7 countries' 1996 inflation rates range from 1.5 percent (Canada) to 2.9 percent (United States).

Among the G-7 nations, 1996 short-term interest rates range from 8.0 percent in Italy to 0.6 percent in Japan. In every instance, the G-7 countries experienced a decline in short-term interest rates from a year earlier. The decline in short-term interest rates ranged from a high of 2.7 percentage points (France and Canada) to a low of 0.6 percentage points (U.S. and Japan).

The Japanese yen depreciated substantially against the U.S. dollar, falling from 94.0 yen in 1995 to a level of 107.6 yen in 1996. Likewise, the deutsche mark (DM), British pound, and the French franc all depreciated against the U.S. dollar in 1996: the DM from 1.43 to 1.50; the British pound from 0.63 to 0.65; and the French franc from 4.99 to 5.09. Only the Italian lira substantially appreciated against the U.S. dollar during 1996, moving from 1,630 to 1,544.

U.S. ECONOMIC OUTLOOK

The Executive Office of the President, Office of Management and Budget (OMB), provides the economic assumptions used in developing the FAA baseline aviation forecasts. The estimates for the period 1997 through 2007 are derived from estimates provided by OMB. For 2008, the FAA uses the consensus growth rates of economic variables prepared by DRI/McGraw-Hill. Inc. (DRI) and The WEFA Group. The projections of GDP used in this year's forecasts data are based on a different method of calculating GDP than those used in prior years. GDP is now estimated using a chain-weighted index. This new method provides *estimates that are not comparable to previous forecast estimates*. The revised method of estimating GDP is discussed in greater detail later in this chapter.

International economic projections of GDP, inflation, and foreign exchange rates are by The WEFA Group. The principal economic series used to develop the FAA aviation forecast are discussed in the following pages. The data are presented in tabular form in Chapter IX, Tables 1 through 5.

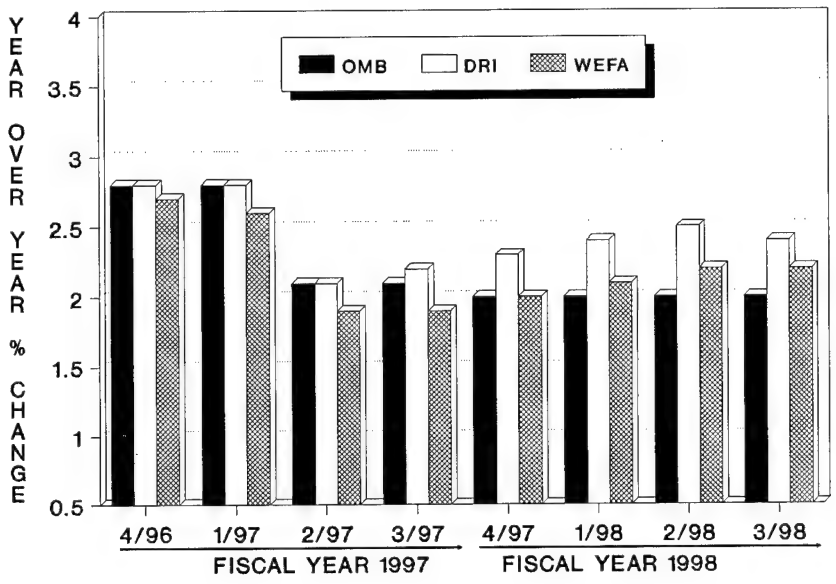
SHORT-TERM ECONOMIC OUTLOOK

Graphics presented on the following page show moderate economic growth accompanied by moderate price increases over the next several years. The OMB estimates indicate that real GDP growth will average 2.4 percent in 1997 and then decline to 2.0 in 1998. Likewise, overall price increases are expected to continue in a moderate range, rising by 2.8 percent in 1997 and by 2.6 percent in 1998.

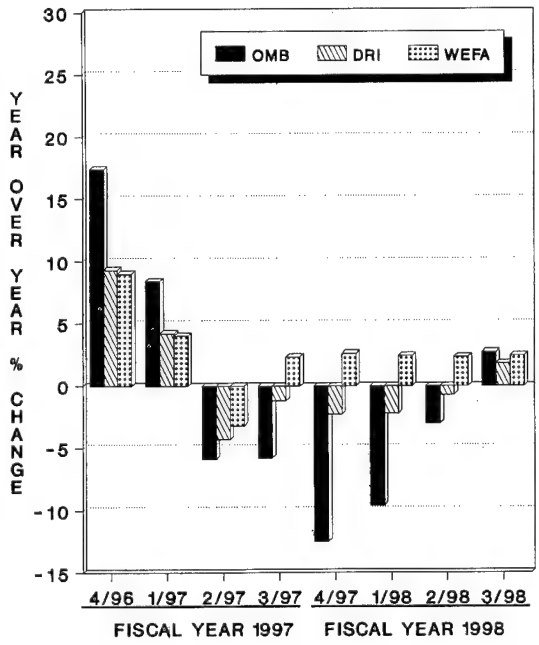
Relatively large fuel price rises during late 1996 brought the annual fuel price increase to 3.5 percent in 1996. This price upsurge in 1996 was the result of rising world-wide demand for fuel in combination with a decline in world-wide inventories. OMB expects this price ascent to reverse. Fuel price are forecast to rise by 3.1 percent in 1997 and then decline by 5.9 percent in 1998 as Iraq increases its oil production and reenters the world oil market.

U.S. SHORT-TERM ECONOMIC FORECASTS

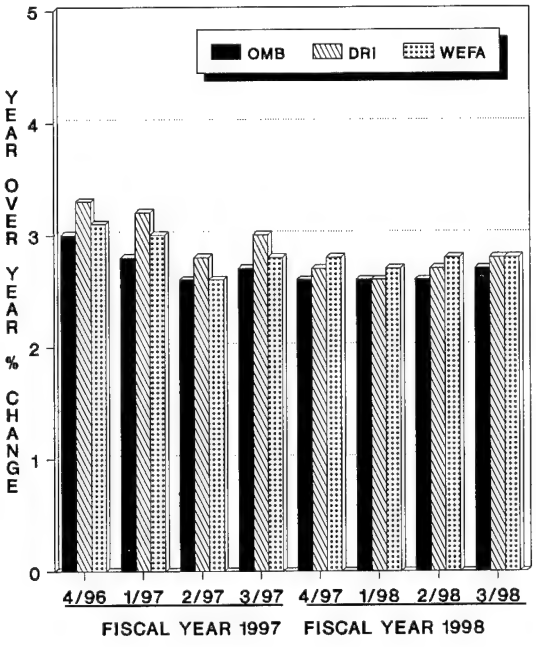
REAL GROSS DOMESTIC PRODUCT



OIL AND GAS PRICES



CONSUMER PRICE INDEX



LONG-TERM ECONOMIC OUTLOOK

The long-term economic outlook for the U.S. economy shows real GDP growth averaging 2.2 percent over the 12-year forecast period. In general, long-term economic growth depends upon growth in skilled labor, growth in capital, and technological innovation. Although growth in the U.S. labor supply may be slowing, it is expected that favorable economic conditions--low interest rates and increasing rates of return to capital--along with accelerating technological change should provide a basis for the U.S. economy to continue to expand at moderate rates throughout the forecast period.

The U.S. labor force grows in proportion to population and labor force participation increases. The U.S. population is forecast to increase approximately 0.8 percent annually over the forecast period. This increase in population, along with a small increase in labor force participation, implies a labor force growth of 1.4 percent annually. Major factors influencing productivity include advancements in education, training, and skills; investment in productivity-increasing capital goods; and productivity-increasing technology.

Real business fixed investment is projected to increase 3.8 percent annually over the forecast period, generating productivity growth of 1.0 percent annually. The government sector share of GDP is expected to decline over the earlier years of the forecast period and then stabilize.

Inflation is expected to remain moderate throughout the 12-year forecast period. The CPI is projected to increase by 2.8 percent annually from 1997 through 2008. The more volatile oil and gas prices are projected to increase somewhat more slowly than the overall rate of inflation, increasing at an average annual rate of 2.0 percent over the forecast period.

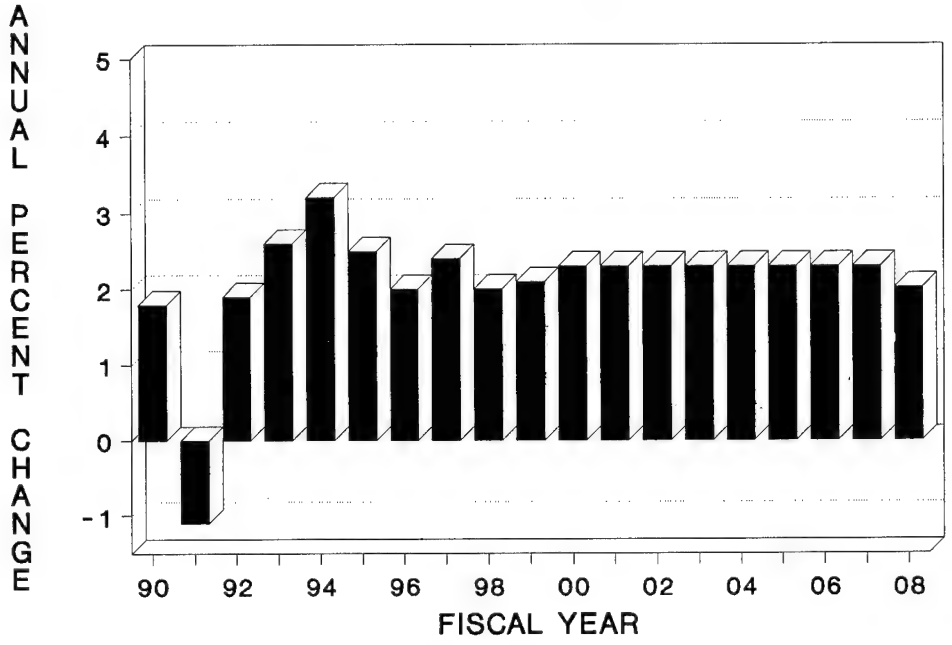
ALTERNATIVE FORECASTS

The alternative forecasts presented in tabular format in Chapter IX, Table 3, show a somewhat different picture of the U.S. economy's future than that presented by OMB. (Data on a calendar year basis.) DRI/McGraw-Hill and The WEFA Group forecasts have been averaged to attain a consensus forecast. In the short term, the consensus forecast shows GDP rising 2.1 and 2.2 percent in 1997 and 1998, compared to OMB's 1997 projection of 2.4 percent and slightly lower 1998 forecast of 2.0 percent. Price inflation for both forecasts stays in a narrow range between 2.6 to 2.8 percent annually. However, projections for oil and gas prices vary significantly. While the alternative forecasts show a moderate 1.3 and 1.2 percent rise in 1997 and 1998, OMB foresees a 3.1 percent rise in 1997 followed by a 5.9 percent decline in 1998.

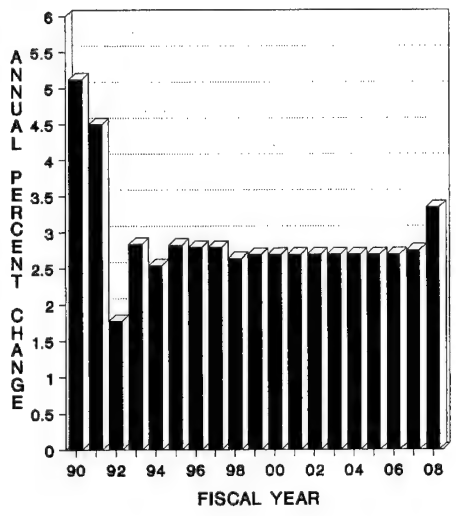
Over the entire period covered by both forecasts (1997-2008), the consensus estimates predict slower economic growth and higher inflation and fuel prices. The consensus forecast shows GDP growth averaging 2.1 percent annually compared to OMB's projected 2.3 percent. Annual changes in overall price inflation equal 3.0 for the consensus forecast versus 2.8 percent for OMB. As in the short term, substantial differences exist between the consensus and OMB's predictions for fuel prices. The alternative forecast shows an annual fuel price increase of 3.1 percent compared to only a 2.0 percent annual increase for OMB.

U.S. LONG-TERM ECONOMIC FORECASTS

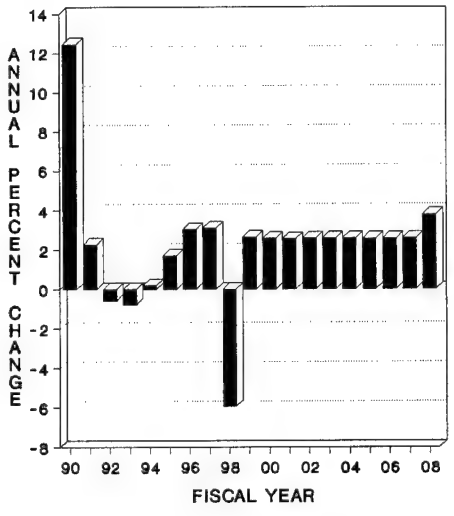
GROSS DOMESTIC PRODUCT
(1992 DOLLARS, CHAIN-WEIGHTED)



CONSUMER PRICE INDEX
(1982-84 = 100)



OIL AND GAS DEFLATOR
(1992 = 100)



WORLD ECONOMIC OUTLOOK

The principal series used in developing the FAA international traffic forecasts are discussed in the following pages. These data are presented in tabular form in Chapter IX, Tables 4 and 5. (Exchange rates for individual countries and GDP for individual, as well as groups of countries, were obtained from The WEFA Group's World Economic Outlook, November 1996). These data are for calendar years and are expressed in 1990 U.S. dollars.

WORLD GDP

The graphics on the following page depict both the historical trend and projected GDP growth for major economic regions of the world. World economic growth is expected to pick up its pace in 1997, with an anticipated growth of 3.0 percent compared to 2.6 percent in 1996. Worldwide GDP (in 1990 U.S. dollars) is projected to rise from $25.3 in 1996 to $37.7 trillion in 2008, an average annual growth rate of 3.4 percent.

Pacific/Far East

The Pacific Basin--which includes Japan, the newly industrialized and developing nations of the Asia Pacific, China, India, Pakistan, Australia, and New Zealand--is expected to continue to show strong economic growth throughout the forecast period. GDP growth in this rapidly expanding region is forecast to average 4.7 percent annually.

Japan, which accounts for more than 50 percent of the region's economic output, grew by a healthy 3.8 percent in 1996, ending a long string of below par growth years. Japan's GDP is forecast to grow 2.7 percent over the forecast period. A major risk for the Japanese economy arises from the probability of continued sluggish growth over the next few years due to a potential weakness in consumer confidence. However, successful deregulation of the Japanese economy could foster innovation and a consequent investment boom.

The economies of the Pacific and developing Asia, including the Pacific Basin countries--Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan, and Thailand--as well as China, India, and Pakistan are expected to continue to develop at rates exceeding most of the world's economies. The combined GDP of these countries is expected to increase from $2.4 to $5.6 trillion during the forecast period, an annual rate of growth of 7.1 percent. China's economic growth is expected to continue to be the highest in the region, averaging 8.6 percent over the forecast period. Although the specific issues affecting growth in this region vary from country to country, political instability and the strong need for infrastructure are expected to continue to plague these developing economies.

Latin America

Latin America countries (including Mexico) displayed solid growth in 1996, with GDP rising by 3.3 percent. The region's economic activity is expected to increase sharply over the next 2 years, with GDP growing by 4.6 in 1997 and by 4.9 percent in 1998. The long-term economic prospects for Latin American countries seem just as positive, with GDP projected to grow at an annual pace of 4.7 percent over the forecast period.

The economies of Brazil and Argentina, major economic forces in the region, are projected to grow by 3.8 and 5.1 percent, respectively, in

1997. This projected growth stems, in part, from the economic integration process involving the Mercosur customs union (including Uruguay and Paraguay as well as Brazil and Argentina). Chile, which is expected to join the union, also has strong GDP growth in its future. The region's future depends on continued structural reforms including tax reform in Brazil and labor reforms in Argentina and Venezuela.

Mexico appears to have recovered from its steep economic decline (GDP down 6.2 percent in 1995), which began with the crash of the peso. Mexico's economic recovery began in 1996 (GDP up 4.2 percent) and is expected to continue throughout the forecast period. Mexico's economy is projected to increase by 4.7 percent in 1997 and by 5.3 percent in 1998, and to average 5.0 percent over the next 12 years. Continued growth depends, in large part, on continued political reform, changes that are currently opposed by the entrenched establishment.

Europe/Middle East/Africa

The combined economies of Western Europe, the Middle East, and Africa are projected to grow at an annual growth rate of 2.7 percent over the forecast period. Western Europe, which accounts for 83 percent of the region's output, is expected to achieve slower economic growth than either the Middle East or Africa, averaging 2.5 percent growth over the 12-year period.

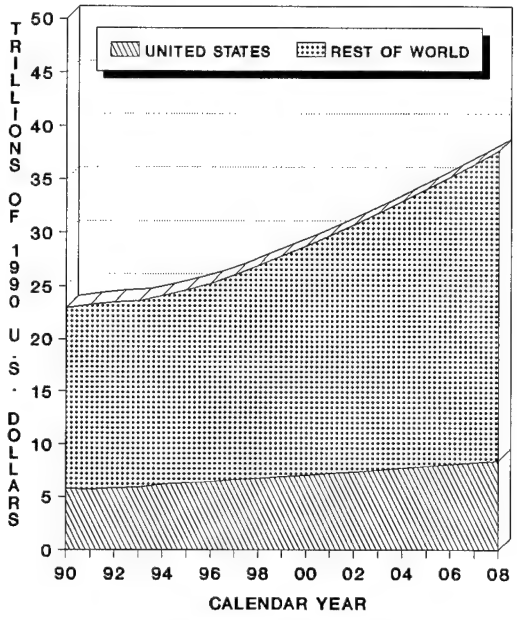
Western European countries experienced relatively slow economic growth in 1996, with GDP increasing by 1.6 percent. Economic growth in the region ranged from a high of 6.7 percent (Ireland) to a low of 0.3 percent (Switzerland). The four largest European countries in terms of economic activity--Germany (up 1.2 percent), France (up 1.0 percent), Italy (up 0.8 percent) , and the United Kingdom (up 2.1 percent)--reported combined economic growth of only 1.2 percent in 1996. The economies of these same four countries are projected to expand at an annual rate of 2.5 percent over the forecast period. During this same period, the economies of Ireland (up 5.0 percent) and Turkey (up 4.2 percent) are projected to be the fastest growing countries in the region.

The prospect of a European Economic Monetary Union (EMU) contributes the major force shaping the future of Western Europe's economies. Establishing the EMU has become an overriding political imperative among the European states, putting aside many other considerations. Establishment of the EMU and a single European currency promises achievement of monetary stability, followed by lower interest rates. Additionally, the EMU intends to eliminate foreign exchange fluctuations, increase labor mobility, improve competition in product markets, and reduce transaction costs. On the downside, the EMU could result in slower or more unstable growth as long as wages remain inflexible. Also, the EMU reduces the power of individual governments to use monetary and foreign exchange policy to absorb external and internal shocks.

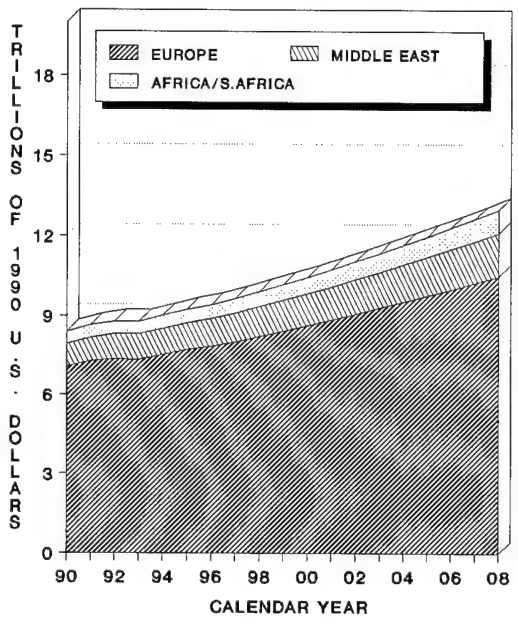
The developing economies of the Middle East and Africa are expected to expand at a more robust pace than are the economies of Western Europe countries. The Middle East countries are forecast to grow from $1.1 trillion (1990 U.S.$) in 1996 to $1.6 trillion in 2008, a growth rate of 3.7 percent annually. The combined economies of the smaller African countries are expected to increase at annual an rate of 4.4 percent. The Middle East, which periodically suffers social and political instability, should continue positive, albeit subdued growth. Higher fuel prices continued to boost the economic growth of this region. Africa remains a region of wide income disparities and dependent on commodity exports.

GROSS DOMESTIC PRODUCT BY WORLD REGION

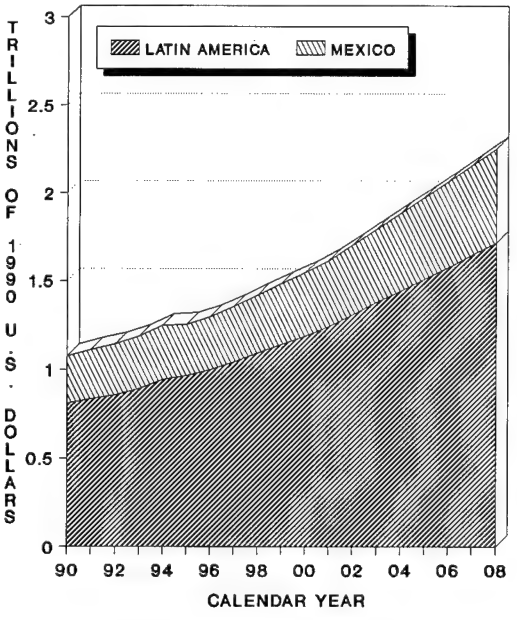
WORLD



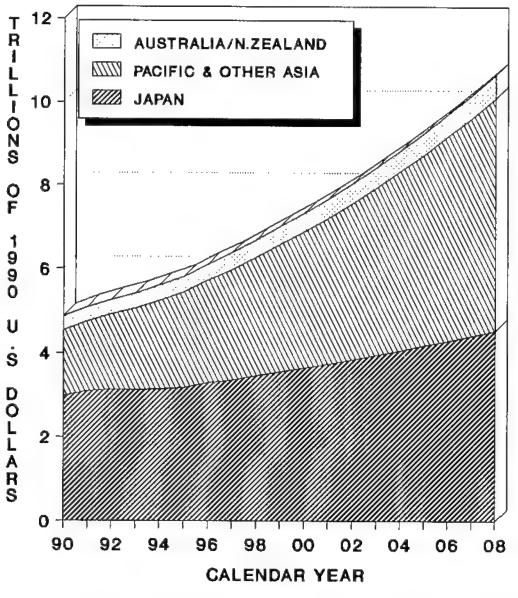
EUROPE/MIDDLE EAST/AFRICA



LATIN AMERICA AND MEXICO



JAPAN/PACIFIC & OTHER ASIA/ AUSTRALIA/NEW ZEALAND

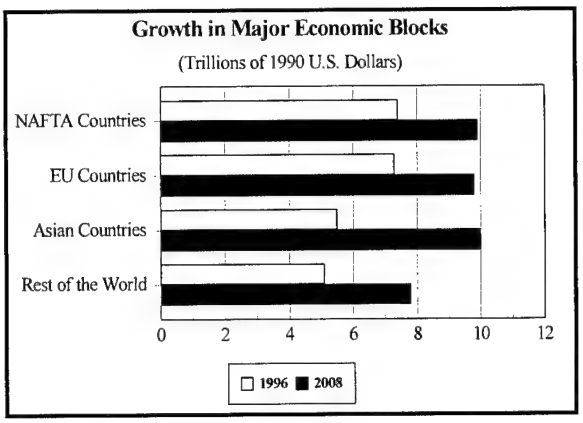


MAJOR TRADE BLOCKS

Economic activity among the world's developed nations continues at a moderate pace in output growth, inflation, and interest rates. The combined GDP of the Summit Seven countries (United States, Canada, United Kingdom, France, Germany, Italy, and Japan) is forecast to grow by 2.1 percent in 1997, 2.6 percent in 1998, and average 2.4 percent over the forecast period.

Prices (as measured by a consumption deflator) are expected to rise 2.1 percent in 1997, 2.3 percent in 1998, and to remain in the moderate range throughout the forecast period. Subdued labor markets and global competition have continued to contribute to a climate of stable prices. In addition, both short-term and long-term interest rates are far from excessive.

Changes in the world economic scene will render a much changed world market place by the end of the forecast period. Over the next 12 years, the order will change substantially in the relative strength of the world's major trading blocks. In 1996, the North American Free Trade Area (NAFTA)--consisting of the U.S. Mexico, and Canada--led the world in economic output, followed closely by the European Union (EU) countries. The Asian trade block--including Japan, China, and Pacific Basin countries--currently lags considerably behind the other trade blocks in economic output. Notwithstanding the continued strength of the NAFTA and EU economic blocks, the Asian block is expected to lead world economic output in the year 2008, with projected GDP of $10 trillion.



DOLLAR EXCHANGE RATE

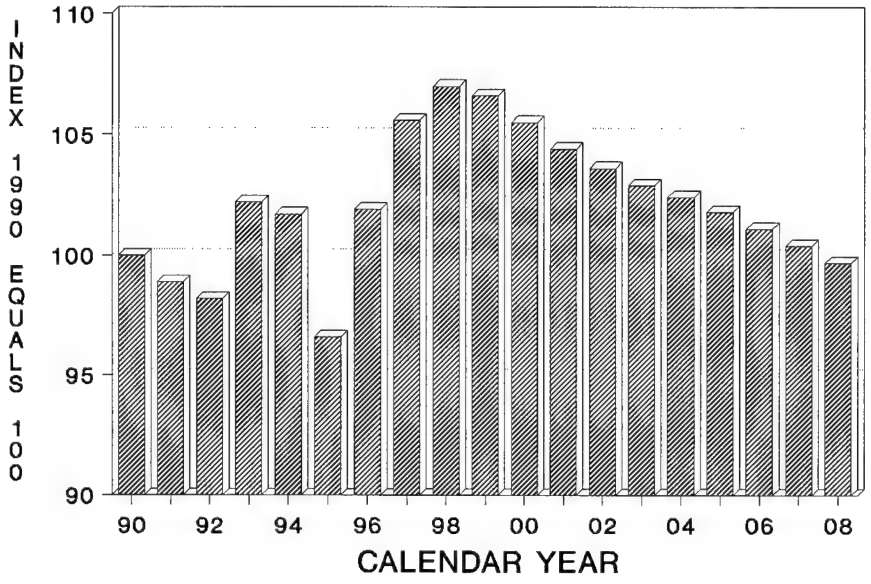
The graphic on page II-12 shows historical and forecast values for the U.S. trade-weighted nominal exchange rate index with other developed countries. The trade-weighted exchange rate measures the relative purchasing power of the U.S. dollar against 23 other countries after accounting for trade differences. The graph also displays the historical and projected dollar exchange rates against the Japanese yen and the deutsche mark. *(Note: a rise in the index implies an appreciation of the dollar against other currencies; a decline in the DM, yen, or pound also implies an appreciation of the dollar against those currencies.)*

The dollar appreciated against the yen in 1996 with the cost of buying 1,000 yen falling to $9.22 from $10.63 a year earlier. The dollar is projected to continue to appreciate against the yen through 1998, then depreciate for the remainder of the forecast period. The deutsche mark (DM) also depreciated against the dollar in 1996. The DM is forecast to fall from $0.67 in 1996 to $0.61 in 1999, then fluctuate up and down against the dollar for the remainder of the forecast period, ending with a value of $0.63 per DM.

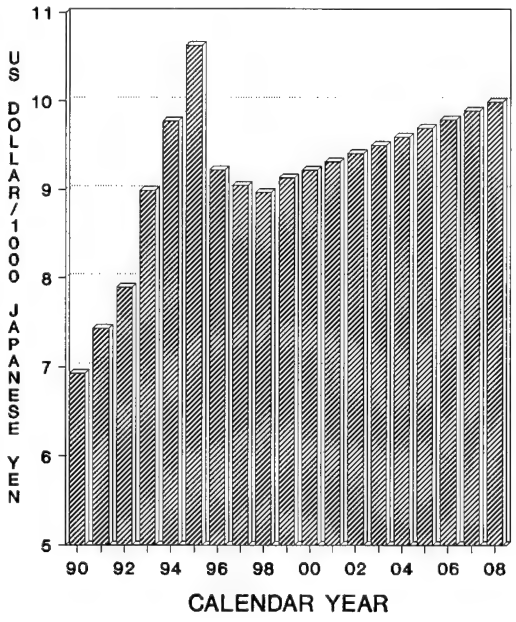
In trade-weighted terms, the dollar rose against all its major trading partners in 1996. The

EXCHANGE RATE TRENDS AND FORECASTS

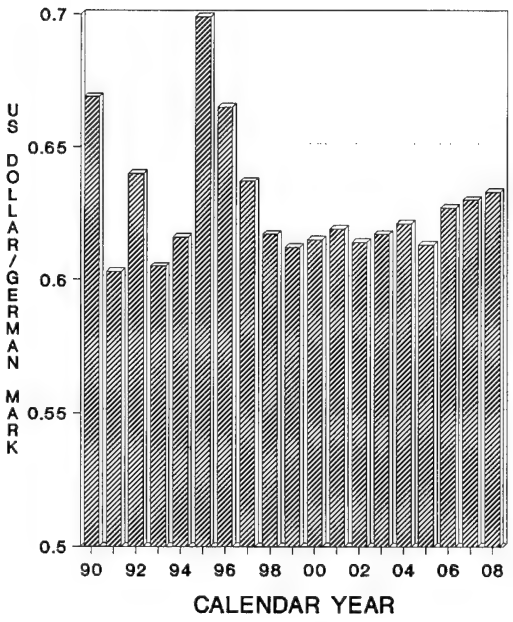
U.S. TRADE-WEIGHTED EXCHANGE RATE
(NOMINAL RATE WITH OECD COUNTRIES)



JAPANESE YEN



GERMAN MARK



purchasing power of the U.S. dollar is projected to increase by just over 5.0 percent during the next 2 years. Beginning in 1998, the strength of the dollar relative to its trading partners is expected to decline throughout the remainder of the forecast period.

OTHER ISSUES

GDP MEASURE

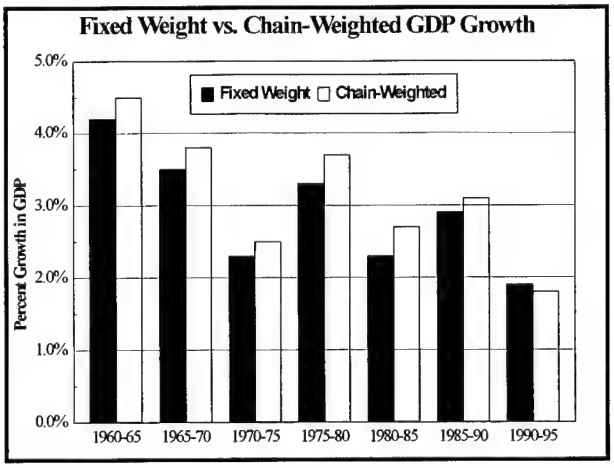
The Bureau of Economic Analysis (BEA) has revised its method of estimating the gross domestic product (GDP). BEA's revisions modify GDP estimates to reflect more accurately changes in the relative prices of goods and services.

The explosive development of computer and computer-related equipment prompted this GDP estimating adjustment. The previous method applied fixed prices from a base year to estimate the amount of goods and services produced. Using this fixed-prices method means that the relative prices of goods and services (for instance, the price of a computer compared to a car) remain at base year levels. Since changes in relative prices become substantial with time, the previous method exacerbated the distortion in economic growth the further the measure is taken from the base year. With drastic price changes in computers and other electronic equipment, the problem became more severe.

The problem with relative price changes arises because a fall in the price of a good or service relative to all other prices induces buyers to purchase more of the lower priced items. Hence, the demand for goods and services with lower relative prices, all other things being equal, increases at a faster rate than the demand for other competing goods and services. In a fixed-weight measurement, this more rapid economic growth is measured at higher price levels. This inaccuracy causes a bias (known as the substitution bias) in the GDP estimates. As a result, business fixed investment that includes computers has risen faster under a fixed-weight estimate than under the new chain-weighted measure.

The graph below demonstrates the difference between the two estimating methods using GDP growth in five-year periods. For every period between 1960 and 1990, chain-weighted GDP estimates increased at a faster rate than the fixed-weight estimate. Since 1990, however, the chain-weighted method shows relatively slower growth.

The chain-weighted (1992$) GDP level grew 0.2 percent less than the fixed weight (1992$) GDP level between fiscal years 1994 and 1995. The difference in the year-to-year growth rate in the two prior fiscal years came to 0.1 percent. Although relatively small in absolute value, these differences required the revision of the FAA national aviation forecasting model.



The revised GDP series required the reestimation of FAA's aviation demand equation that relates RPMs to GDP and yield. Although the same independent variables were used in the model, the model's functional form and parameter estimates changed to account for the revised growth rates of the historical GDP

series. *As a result, GDP projections and their relationship to traffic growth should not be compared to previous FAA forecasts.*

POTENTIAL CHANGES IN THE CPI

Recently a panel of economic experts (the Boskin Commission) reported that the government's consumer price index has overstated price inflation for at least 25 years, suggesting the current CPI may overstate inflation by as much as 1.1 percentage points annually. This statement by five of the country's leading economists has a strong possibility of compelling changes in the method used to measure inflation.

The Commission contends that several factors are responsible for this overstatement of price inflation. A substitution bias ensues from the current method's use of a fixed basket of goods to measure prices. The Commission notes that when prices go up too rapidly, some shoppers decide to buy at discount stores or choose to buy altogether different goods. The Commission also contends that the present inflation measure excludes product-quality improvements.

A change in the CPI has many political ramifications, since the government uses the CPI to adjust wages and pensions each year to protect workers and retirees from inflation. In addition, nearly every important measure of the economy embeds the CPI in one manner or another. To recalculate the CPI implies a fundamental recasting of many other aspects of the economy.

Changes in the CPI could also impact the FAA estimates of future aviation activity. The FAA currently uses the CPI to measure the real change in fares and fuel prices. The resultant values are used as exogenous variables in its econometric models to forecast the demand for air travel. Over the past 25 years real passenger fares have declined by an average of 2.0 percent. If the CPI has, in fact, been overstated by 1.1 points annually, then it implies that the decline in real passenger fares has also been significantly overstated--by more than half of the assumed decline. Changes of the magnitude discussed by the Commission could have a significant impact on the structural properties and parameter estimates of the models used to project commercial aviation activity.

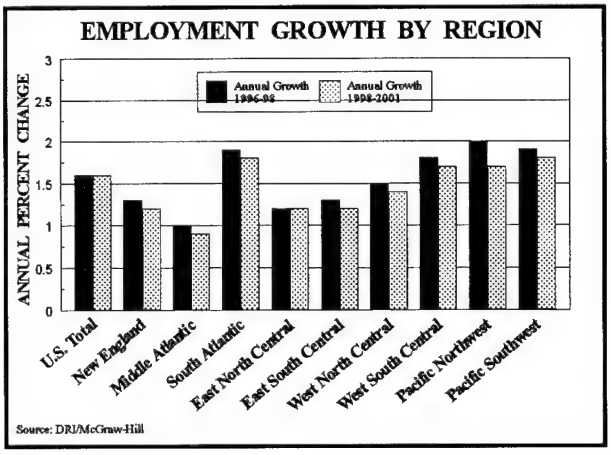
REGIONAL ECONOMIES

While U.S. economic growth is projected to continue at a steady, moderate pace, the economic strength of various regions within the U.S. will vary substantially. Aviation growth in any particular region of the United States is directly related to its economic fortunes. Employment growth provides a good indicator of regional economic performance. The graph below shows employment growth by region for two periods--1996 to 1998 and 1998 to 2001.

Over the next 5 years, the South and West are expected to achieve the largest growth in employment. Ten States in these regions are forecast to achieve the fastest growth in employment--Nevada, Arizona, Utah, Florida, New Mexico, Idaho, Oregon, Colorado, Georgia, and Texas. The resurgence of California's economy, in combination with expanding trade with Pacific Rim countries, has fueled growth in the West. Lower costs, including labor costs and business taxes, along with many amenities have fired the growth in the South. Southern states also present an integrated transportation network and easy access to South American, as well as other world markets.

The East North Central region--including Illinois, Indiana, Michigan, Ohio, and

reflects a moderating demand in capital goods and labor shortages. The New England region (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont) and the Middle Atlantic region (New York, New Jersey, and Pennsylvania) are projected to experience the country's slowest employment growth. Growth in these regions will lag the rest of the nation due to a combination of sluggish population growth along with consolidations in financial services, utilities, and defense-related manufacturing. The New England region performs somewhat better than the Mid-Atlantic states due to the strength of its high-tech industries.



SUMMARY AND IMPACT ON AVIATION

The outlook for the U.S. economy is for moderate growth in both economic activity and consumer prices, both in the short term and throughout the entire 12-year forecast period. Economic activity is expected to expand by 2.3 percent annually, while consumer prices are forecast to increase by an average 2.8 percent. Fuel prices are expected increase at a pace less than overall inflation, 2.0 percent annually over the forecast period.

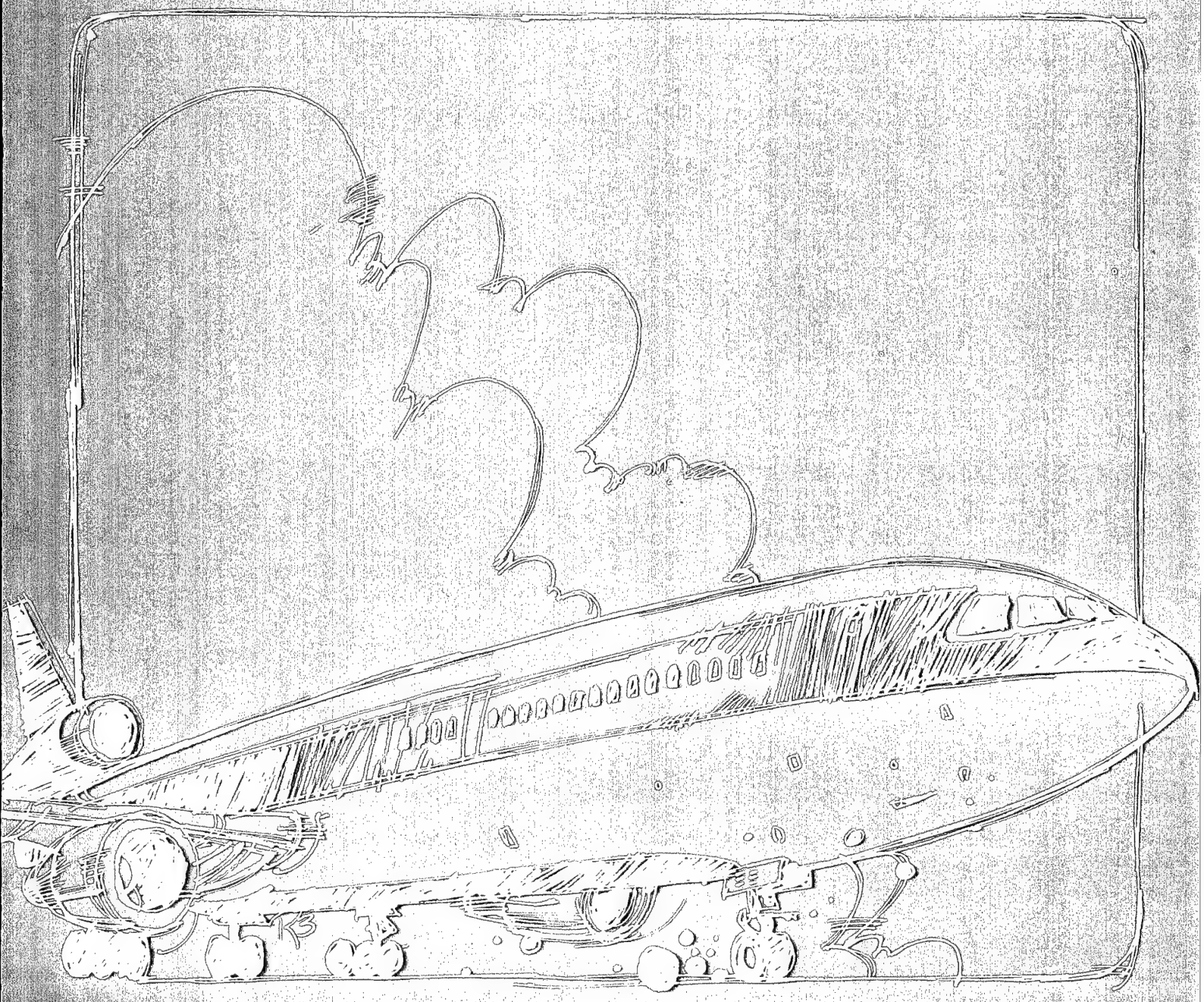
For the world in total, real GDP is forecast to grow by 3.0 percent in 1997, 3.5 percent in 1998, and to average 3.4 percent over the next 12 years. Economic growth for the largest economies, as represented by the Summit Seven countries, is projected to increase at near 2.4 percent over the period. Prices are expected to remain in the moderate range over the same period.

Asian countries are expected to provide the momentum for world growth during the forecast period, expanding their output at a rate of 4.7 percent annually. This growth is expected to thrust this economic block into the role of world economic leadership, exceeding both the NAFTA countries and the European Union countries.

For the short and long term, economic growth in the U.S. and the world will continue along on a positive and stable path with prices remaining stable. The domestic and international forecasts assume a positive, stable economic environment for U.S. commercial aviation. Under these conditions, U.S. commercial aviation is expected to continue to compete adequately for world markets and continue to expand its U.S. markets.

CHAPTER III

COMMERCIAL AIR CARRIERS



CHAPTER III

COMMERCIAL AIR CARRIERS

In fiscal year 1996 there were 85 U.S. commercial airlines (both scheduled and nonscheduled) reporting traffic and financial data to the Bureau of Transportation Statistics (BTS), Department of Transportation (DOT), on Form 41. There were 62 passenger airlines (operating aircraft with over 60 seats) and 23 all-cargo carriers. While there are more carriers this year than last, additions are primarily in the scheduled segment of the industry.

Forty-five of the airlines provided scheduled passenger service and constitute the focus of the air carrier forecasts (both domestic and international) discussed in this chapter. Forty of the carriers provided scheduled domestic service (within the 50 States, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands), while 15 of the carriers provided scheduled international service. Of the carriers providing scheduled international service, 11 served Atlantic routes, nine served Latin American routes, and six served Pacific routes.

Air carrier traffic forecasts and assumptions discussed here are presented in Chapter IX (Tables 6 through 18). FAA air carrier workload forecasts are discussed in Chapter VII and presented in Chapter IX (Tables 28 through 41).

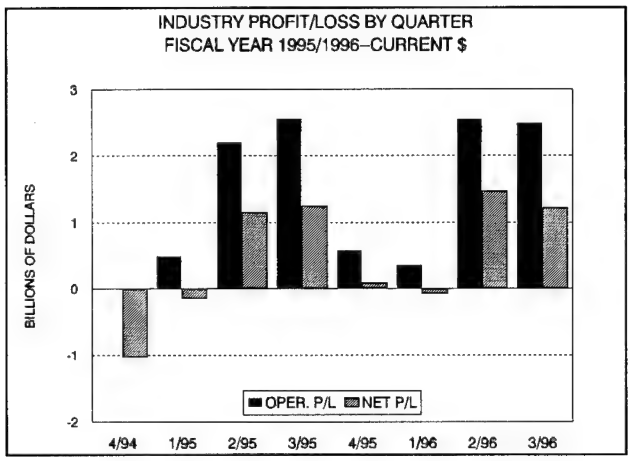
It should be noted that all specified years in the remainder of this chapter are fiscal years (October 1 through September 30), and specified quarters are calendar quarters, unless designated otherwise.

REVIEW OF 1996

FINANCIAL RESULTS

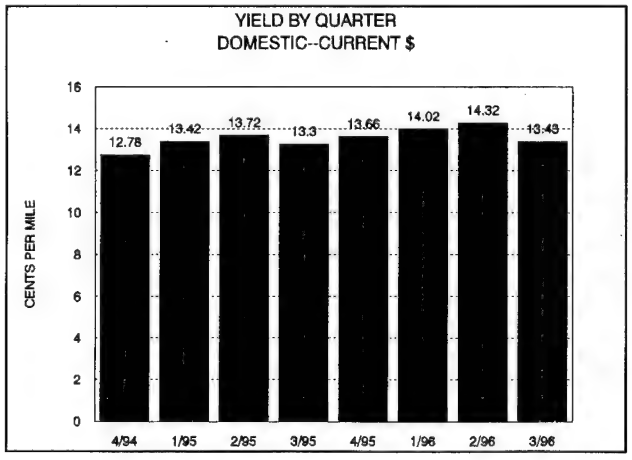
In 1996 the financial performance of the U.S. commercial airline industry was exceptional. The U.S. economy continued to expand in 1996, along with the key economies of Europe, Asia, and Latin America. The continued financial success was largely based on capacity control, strong growth in traffic, and the firming of yields throughout the year. The slowing of growth in capacity pushed domestic and international load factors to all time highs.

Operating profits in 1996 were more widespread than in 1995. In 1996, all 12 major carriers in the industry made an operating profit. The shift in operating profit between the years 1996 and 1995 was over $700 million. The industry operating profit in 1995 was $5.3 billion. In 1996 the operating profit was $6.0 billion, 14 percent higher than the 1995 level.

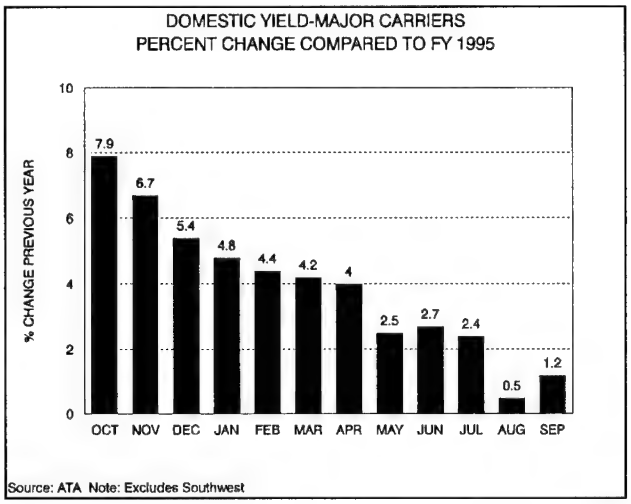


The industry experienced operating profits in all four quarters of 1996. For the year, operating revenues increased 7.7 percent, while operating expenses increased 7.3 percent. In 1995 operating expenses were up 2.9 percent, and in 1994 they increased 2.4 percent. The significant increase in operating expenses was, in part, due to a large run-up in fuel costs. In 1996 nominal fuel prices increased 12.5 percent.

An important financial change for the year was the relatively large increase in yields for the major carriers and the industry during all four quarters of the year. For the industry, domestic nominal yields were up 4.1 percent, while yields, adjusted for inflation increased 1.3 percent. The most recent data indicates that fares are continuing to increase. In October, the major carriers had a 0.9 percent increase in domestic yields.

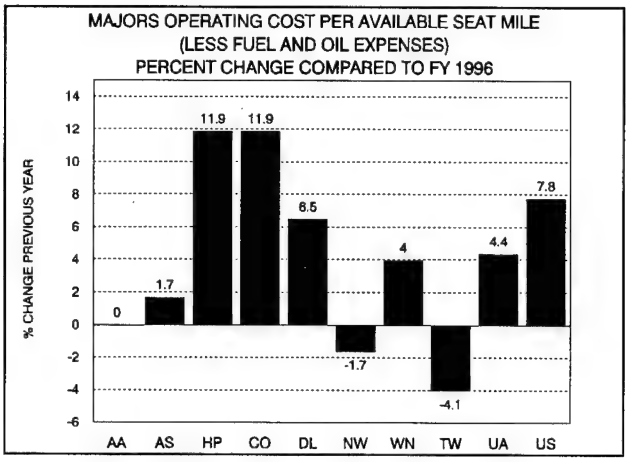


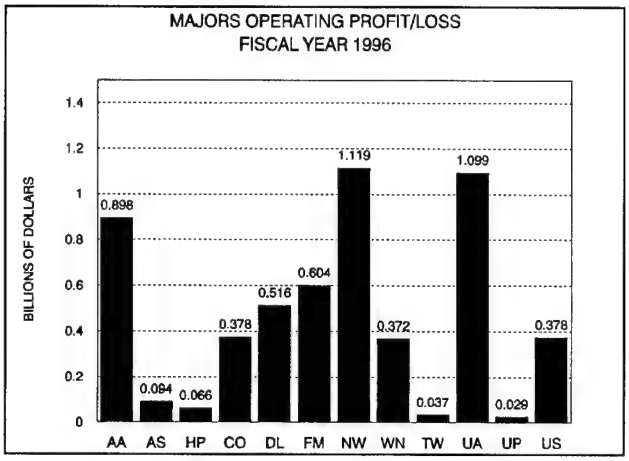
During 1996, nominal international yields decreased 2.1 percent to 10.93 cents. The Atlantic market (10.25 cents) was up 3.7 percent, while the Latin American (13.57 cents) and Pacific (10.50 cents) markets declined 0.9 percent and 9.1 percent, respectively.

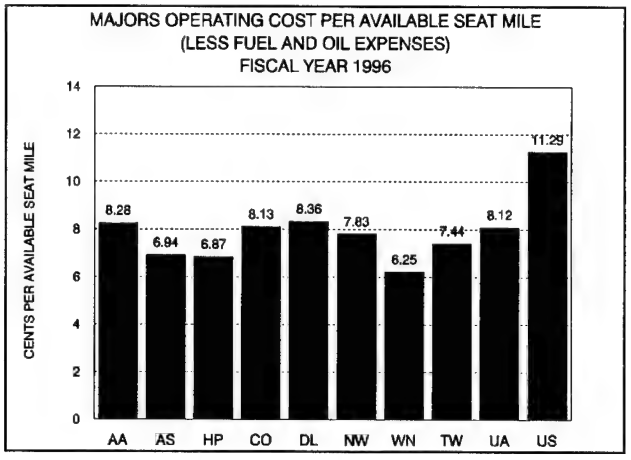


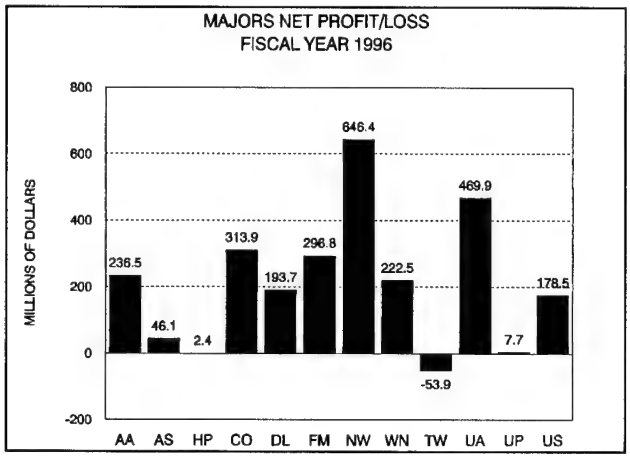
During 1996, two major carriers reduced their unit costs, which were estimated without fuel and oil expenses. This statistic, adjusting for energy costs, is a more appropriate measure of an air carrier's ability to manage controllable costs. The largest reduction in unit costs of 4.1 percent was achieved by TWA, followed by Northwest with a reduction of 1.7 percent; American's unit costs showed no change in 1966.

In 1996, Southwest had an operating cost per available seat mile of 6.25 cents. The highest unit cost among the major carriers was USAir with 11.29 cents. In 1996, system average operating cost per available seat mile (excluding fuel and oil), was 8.22 cents, up 3.0 percent from 1995. System unit costs (including fuel and oil) increased 3.9 percent.









For the third consecutive year, U.S. airlines posted a net profit of almost $2.7 billion--a 125 percent increase over 1995. In both 1994 and 1995, the industry achieved net profits of $1.2 billion.

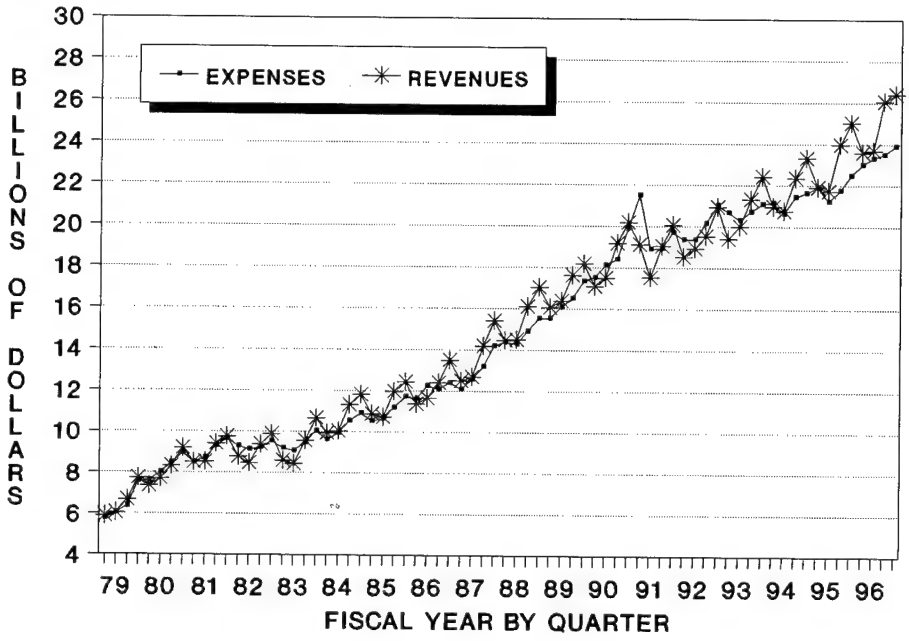
The following two graphs show operating and net profit and loss for the air carriers classified as majors. Both of the cargo airlines made an operating profit. All 12 major airlines showed an operating profit in 1996, compared to nine in 1995. Of the ten passenger airlines, Northwest and United had the largest operating profits at $1.1 billion, while TWA had the lowest operating profit at $36 million.

During the next several years intense competition within the industry is expected to push real yields downward. However, falling yields along with modest to strong growth in the economy will continue to expand aviation activity and increase passenger revenues. The industry is also undergoing major structural changes in an attempt to control and reduce operating costs. If the carriers are successful, we can expect operating profits to continue to improve in the short- and long-term.

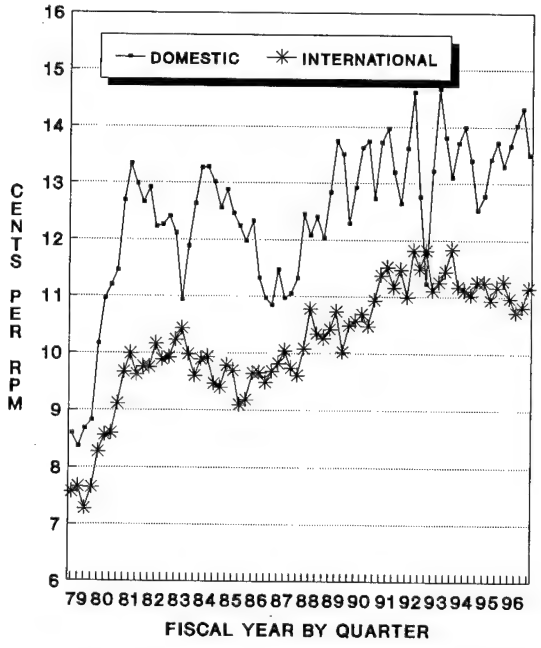
The current forecast assumes declining real yields and continued strong growth in aviation activity. This would allow for industry financial improvement in 1997 and beyond, assuming that costs can be brought under control.

U.S. AIR CARRIER REVENUE AND COST TRENDS

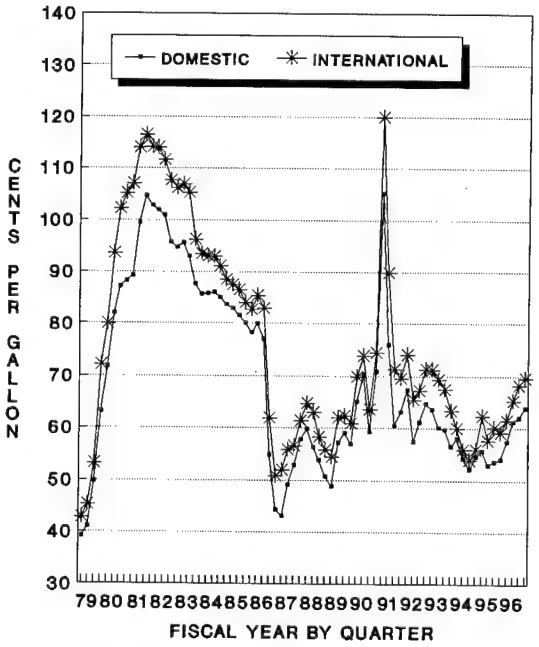
OPERATING REVENUES AND EXPENSES



PASSENGER YIELDS



JET FUEL PRICES



(ALL VALUES IN CURRENT DOLLARS)

SCHEDULED PASSENGER TRAFFIC AND CAPACITY

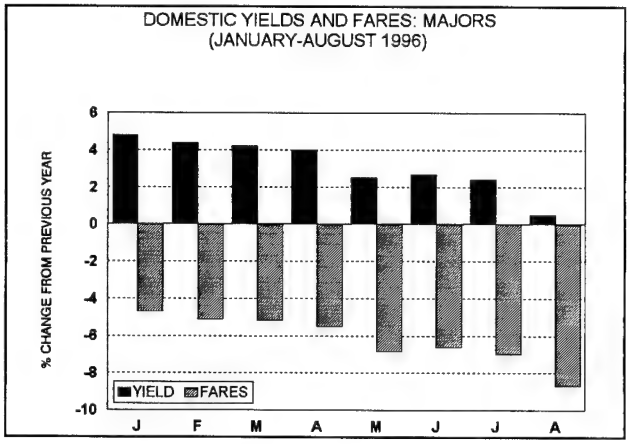
Scheduled system (domestic and international) passenger traffic on U.S. commercial airlines showed significant growth in 1996. System demand for air travel, as measured in revenue passenger miles (RPMs), increased 6.1 percent. This follows 1995's increase of 5.3 percent. Domestic RPMs, which account for over 70 percent of system RPMs, increased at a relatively faster rate than international RPMs .

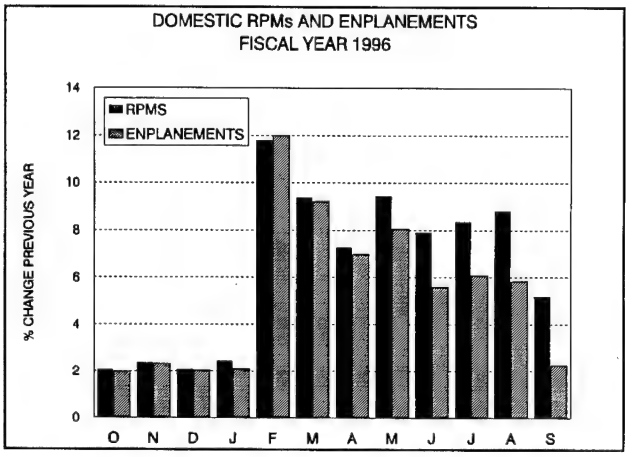
The slower growth in total international traffic was attributable to an increase of only 0.5 percent in RPMs in the Atlantic market. The Latin American and Pacific markets both increased at faster rates than the domestic market. The increases were 8.9 percent and 7.6 percent, respectively.

System available seat miles (ASMs) increased 2.9 percent, down from the 3.6 percent increase achieved in 1995. The increase resulted in a system load factor of 68.8 percent, up 2.1 percentage points from 1995's record high level of 66.8 percent.

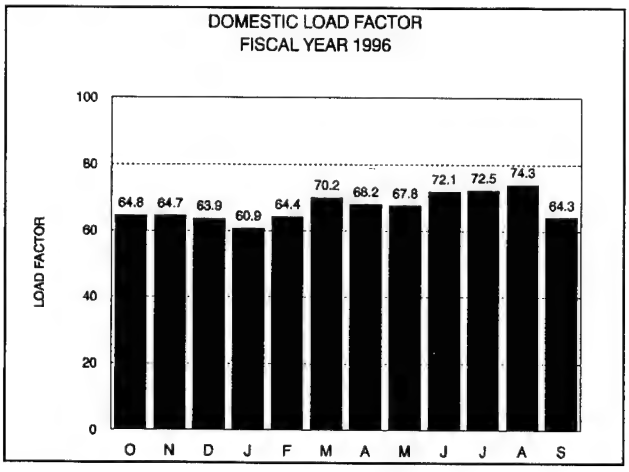
Domestic Passenger Traffic and Capacity

Domestic RPMs increased 6.6 percent in 1996 to 418.6 billion. This outcome was largely the result of the relatively strong growth in the economy and the decline in fares due to the expiration of the 10 percent ticket tax on January 1, 1996. The tax was reinstated at the end of August, but expired December 31, 1996. Although fares (which include the ticket tax) declined from January through August, yields (which exclude the ticket tax) increased, which both stimulated demand and increased operating revenues. For the year as a whole, yield was up 4.1 percent; however, fares declined about 2.3 percent. In 1996, domestic passenger enplanements increased by 5.5 percent .



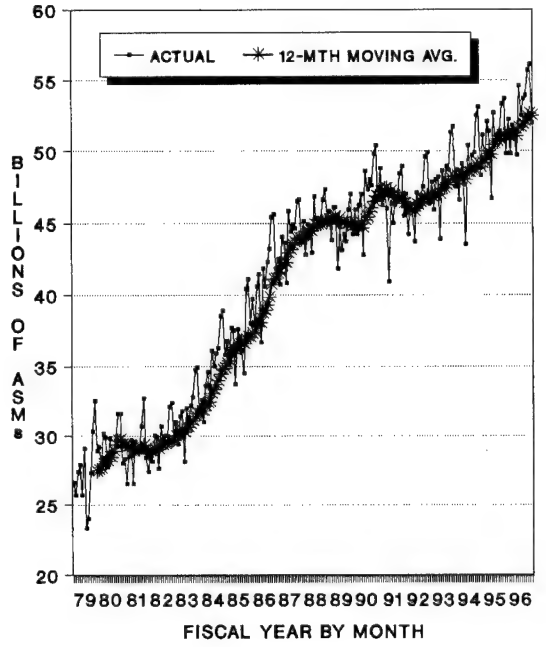


Domestic capacity expanded by 3.1 percent in 1996. This increase, along with an increase in RPMs of 6.6 percent, resulted in a load factor of 67.5 percent--the highest ever achieved on domestic routes.

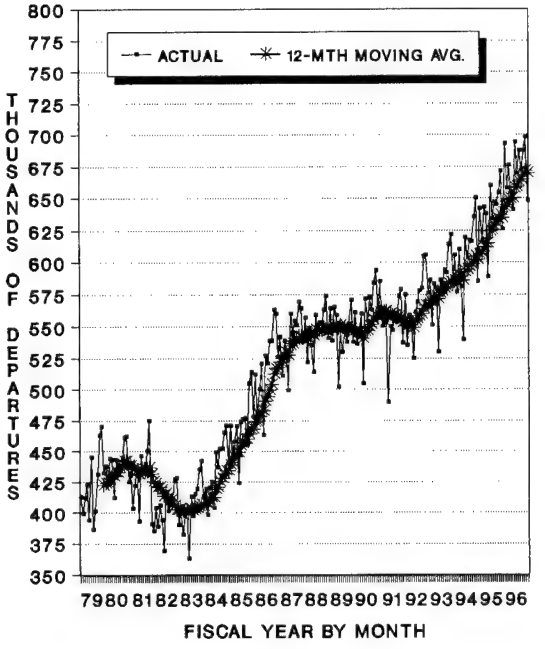


U.S. AIR CARRIER DOMESTIC TRAFFIC TRENDS

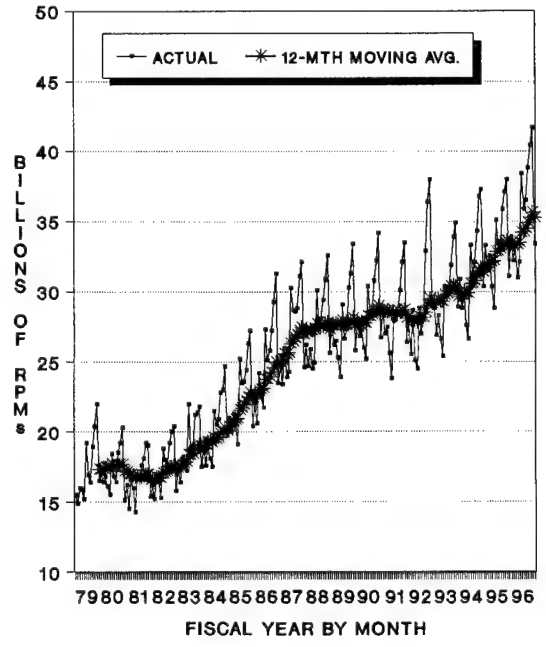
AVAILABLE SEAT MILES



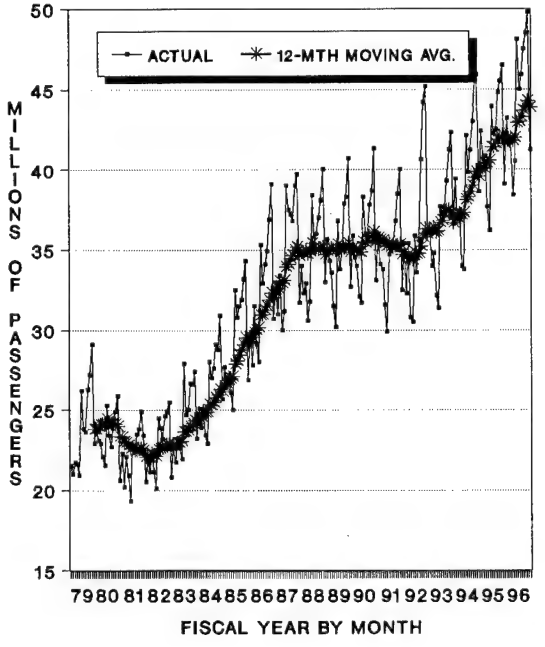
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS

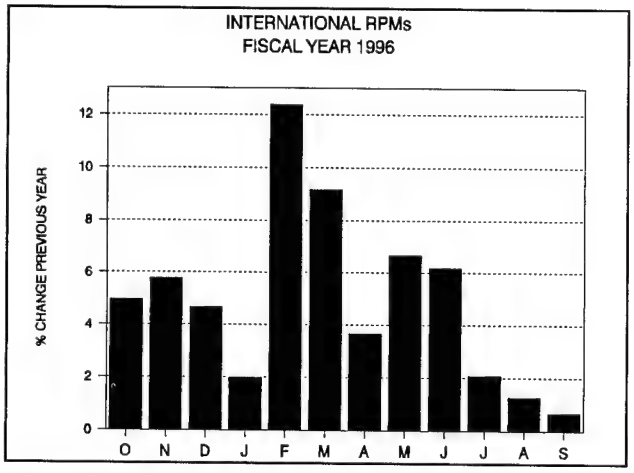


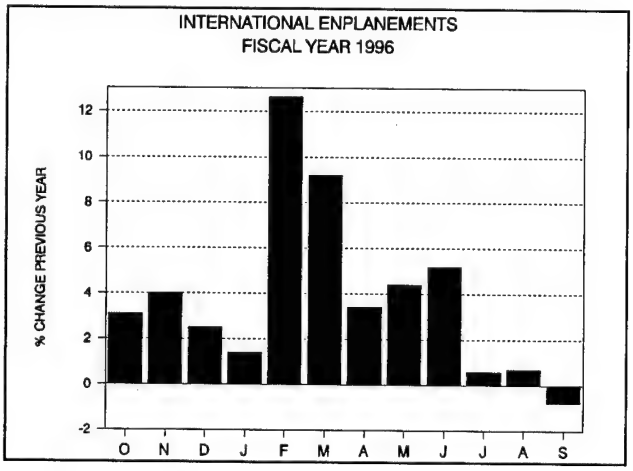
U.S. Air Carriers' International Passenger Traffic and Capacity

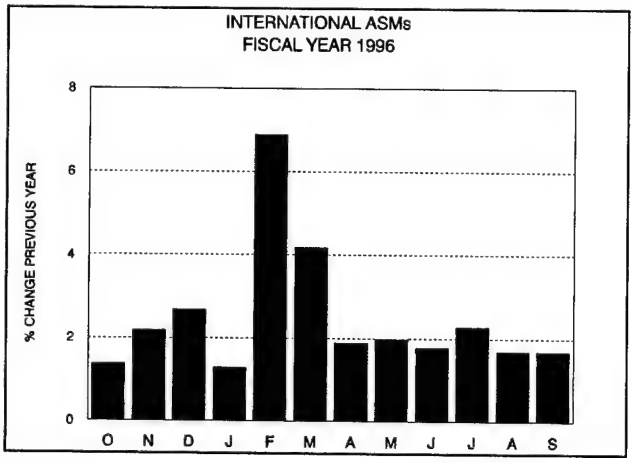
International traffic continued to show growth in 1996, with RPMs increasing 4.7 percent and enplanements up 3.6 percent. In 1995 RPMs and enplanements increased 4.1 percent and 4.8 percent, respectively. Growth in traffic along with relatively slower growth in ASMs of 2.4 percent, pushed the load factor to 72.9 percent--an increase of 1.6 percentage points. This is the highest load factor achieved in the international sector during the past 25 years.

The significant growth in international traffic is attributable to both the Latin American and Pacific markets. The Atlantic market, which now accounts for about 43 percent of total international traffic, showed a relatively small increase in RPMs and a decline in enplanements. From 1986 through 1996 the Atlantic market's share of total international traffic dropped over 8 percentage points. During this period, Atlantic RPMs grew 7.1 percent a year, while Latin American and Pacific RPMs grew at annual rates of 9.2 percent and 11.4 percent, respectively.

The strength of the international market is clearly evident when comparing 1996 monthly growth rates with the same months of last year. As the accompanying graphs show, RPMs increased in every month of 1996 relative to 1995, while enplanements only declined in September. Along with this growth, capacity expanded in every month of 1996.

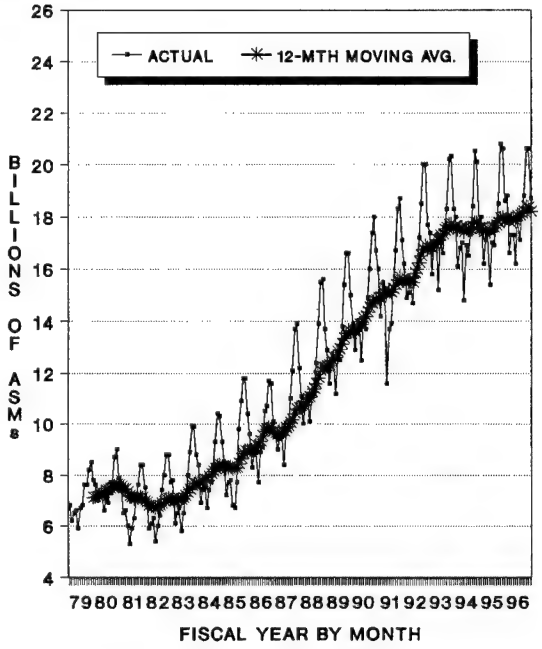




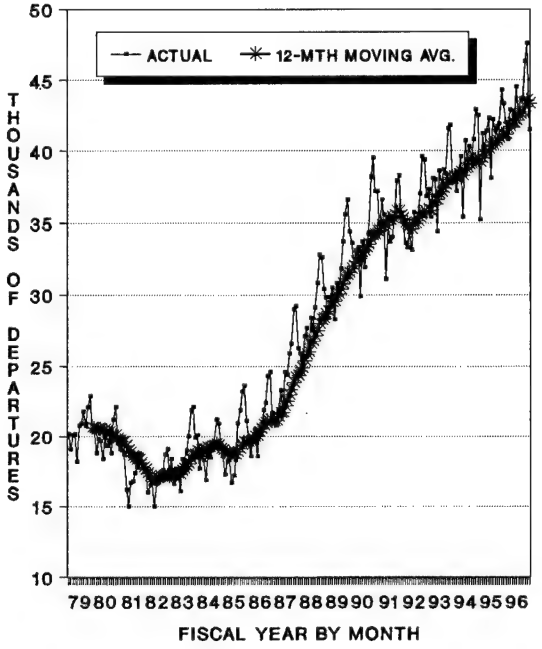


U.S. AIR CARRIER INTERNATIONAL TRAFFIC TRENDS

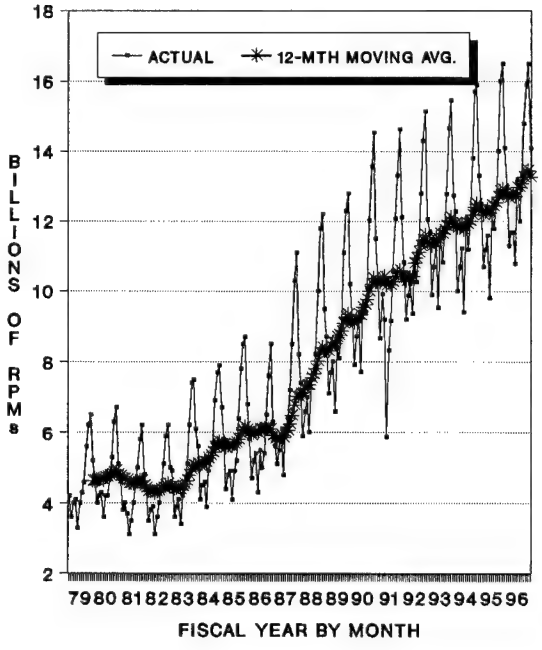
AVAILABLE SEAT MILES



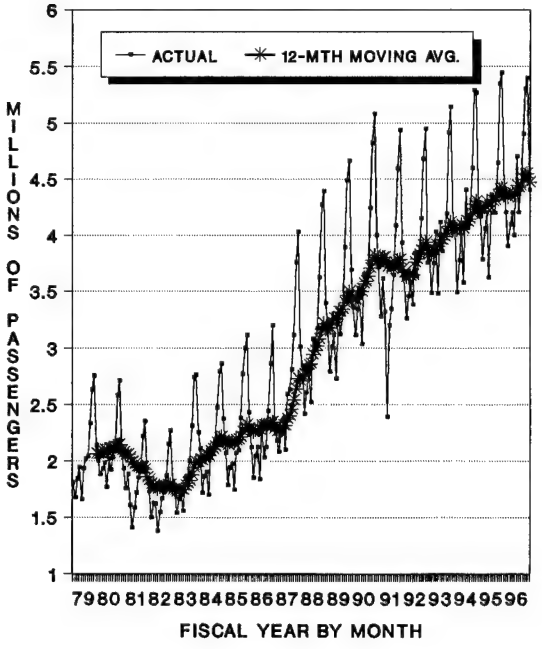
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS



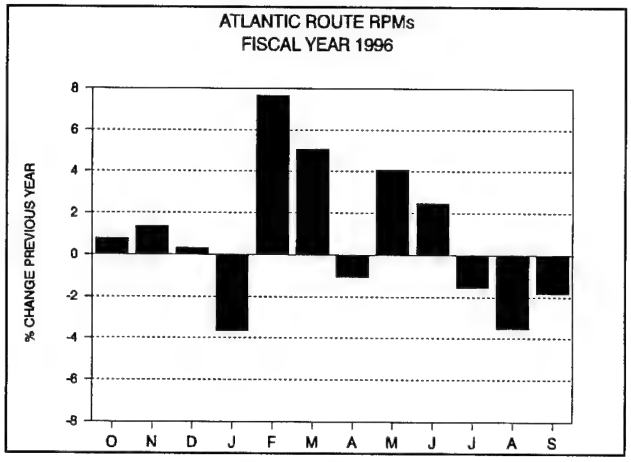
Atlantic Routes

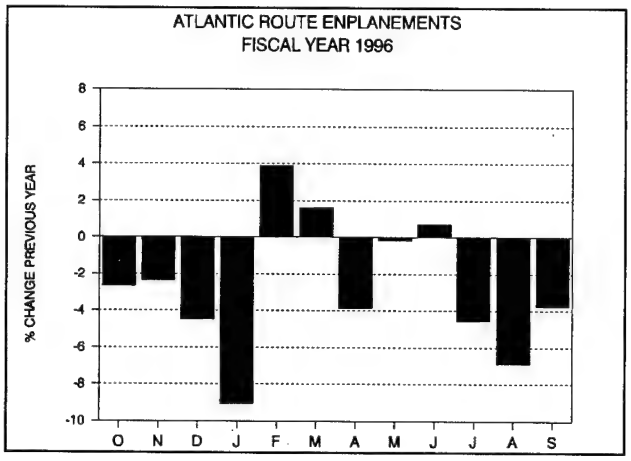
In 1996 transatlantic RPMs were up only 0.5 percent, while enplanements decreased for the second year in a row. The number of passengers enplaned totaled 15.8 million, a decrease of 2.9 percent from 16.2 million in 1995. In 1995 RPMs increased only 0.3 percent while enplanements decreased 1.5 percent.

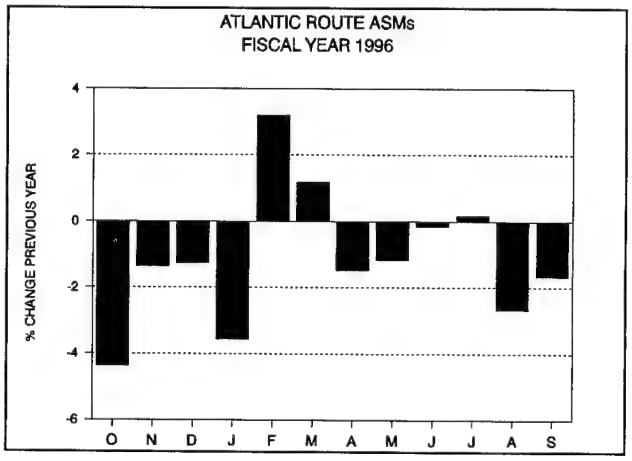
For the period 1986 through 1996 RPMs, enplanements, and capacity increased at yearly rates of 6.9, 4.1, and 3.8 percent, respectively. Capacity declined 1.2 percent in 1996, which pushed the load factor up to 76.3, 1.3 percentage points higher than 1995.

Slow growth in RPMs and declining enplanements on the Atlantic route are probably the combined result of streamlining efforts by U.S. carriers, bilateral agreements with France and England, and the types of alliances negotiated between U.S. carriers and foreign flag carriers. These factors have led to a reduction in U.S. air carrier capacity, the elimination of routes, and a shifting of traffic to allied foreign flag carriers. In CY 1995, U.S. flag carriers market share declined 2.3 percentage points. Based on incomplete data for 1996, a similar loss in market share is expected.

The fall of yields through the early part of the 1990s was reversed in 1995 and 1996. From 1991 through 1994 real and nominal yields continuously declined at yearly rates of 5.0 percent and 2.4 percent, respectively. In 1995 nominal yield increased 6.4 percent, and real yield climbed 3.4 percent. In 1996 nominal yield increased 3.7 percent and real yield increased 0.9 percent.

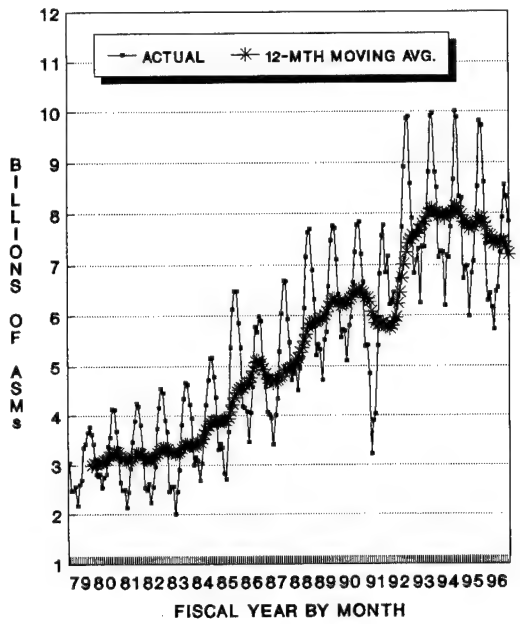




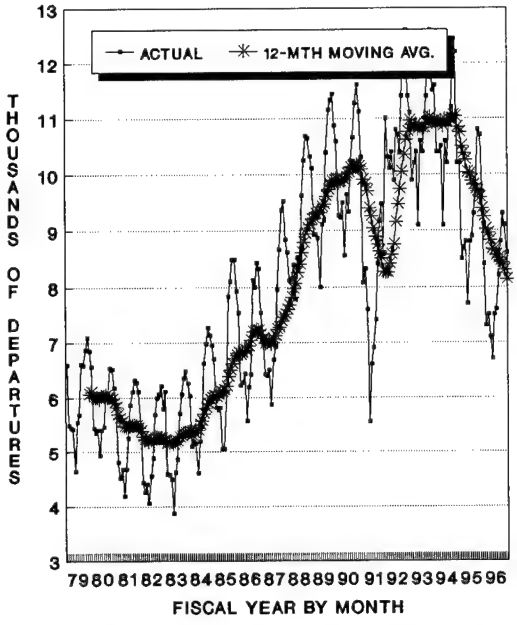


U.S. AIR CARRIER CAPACITY AND TRAFFIC TRENDS
INTERNATIONAL OPERATIONS - ATLANTIC ROUTES

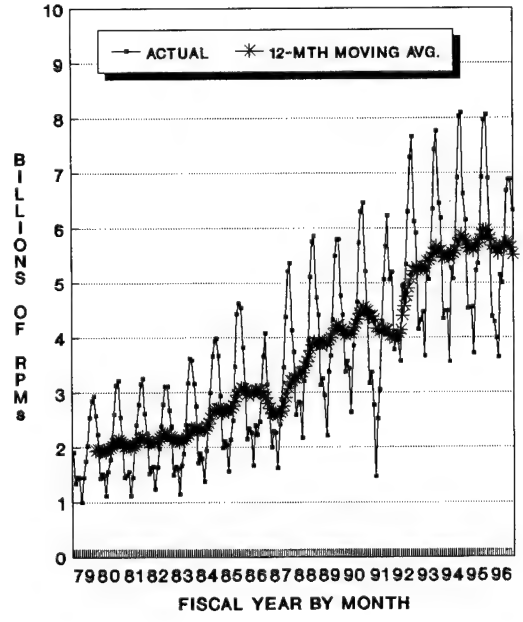
AVAILABLE SEAT MILES



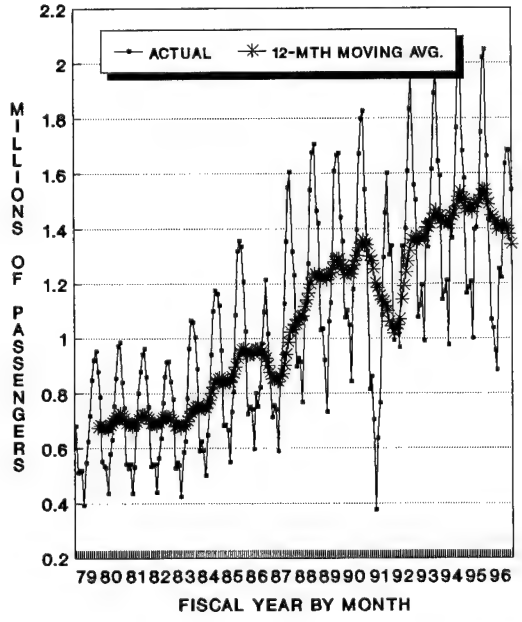
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS



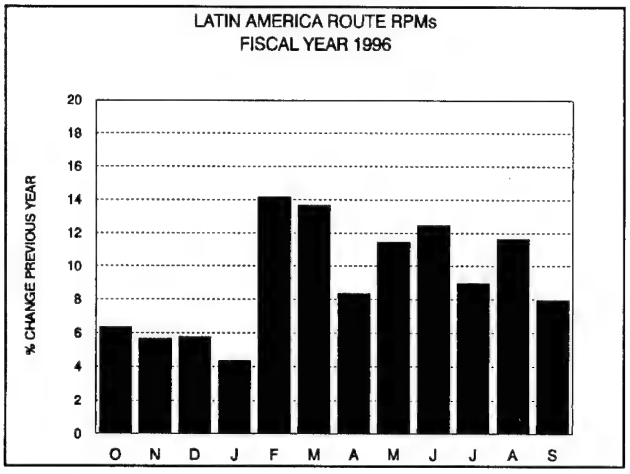
Latin American Routes

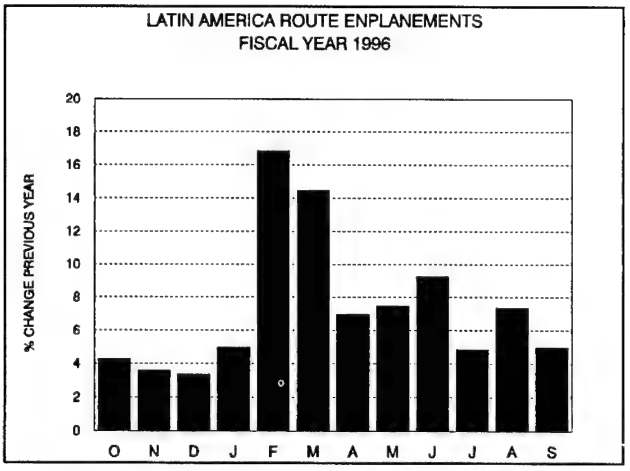
Traffic demand to Latin America (destinations in South America, Central America, Mexico, and the Caribbean) continued to grow at relatively rapid rates. In 1996 RPMs and passenger enplanements were up 8.9 percent, and 6.9 percent, respectively. For the period 1986 through 1996 RPMs increased at an annual rate of 9.2 percent, while enplanements increased 8.5 percent a year.

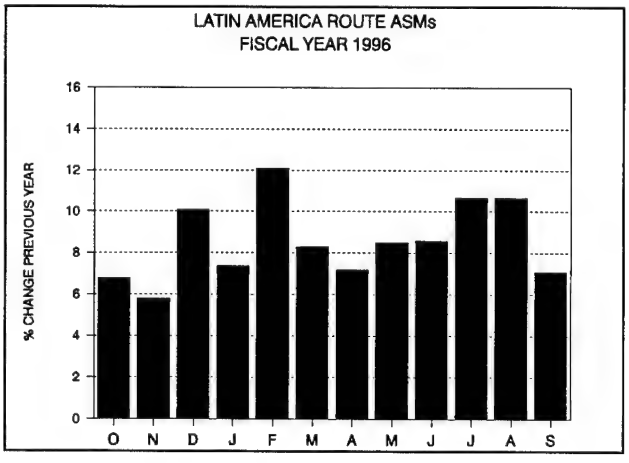
Capacity also expanded in 1996, but at a somewhat slower rate than traffic. ASMs increased 8.6 percent, pushing the load factor up 0.2 percentage points to 63.2 percent, the highest level achieved in the past 25 years. The continued expansion of U.S. carriers into deep South America--Argentina, Brazil and Chile--increased the average trip length by about 2 percent (26 miles). Since 1990 the average trip length has grown over 12 percent.

The latest data also shows that the scheduled U.S. flag share of the Latin American market continued to expand. In CY 1995 the U.S. flag share was 64.2 percent, up from 63.6 percent in CY 1994. The strong competitive challenge from the U.S. carriers has encouraged Latin American carriers to privatize and restructure in an effort to reduce operating costs. In 1989 most of Latin America's major international carriers were government-owned. Today there are only a few state airlines. Clearly, these industry changes will pose additional challenges for the U.S. carriers over the next several years.

Expansion in traffic was largely the result of continued strong economic growth in the United States and Latin America, and declining fares. In 1996 nominal yield fell 0.9 percent and yield, adjusted for inflation, dropped 3.7 percent.



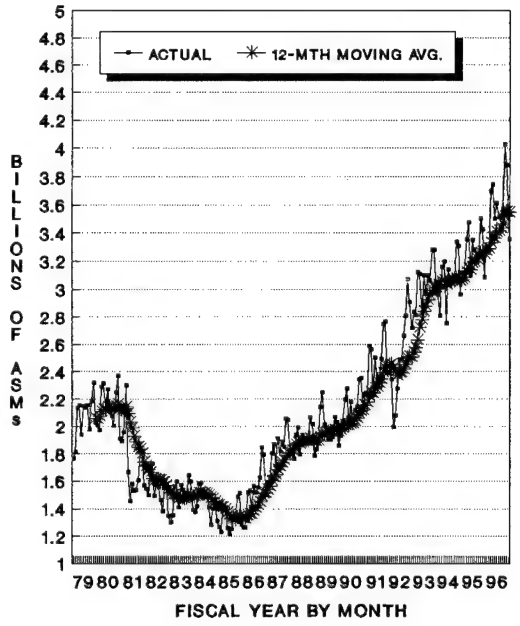




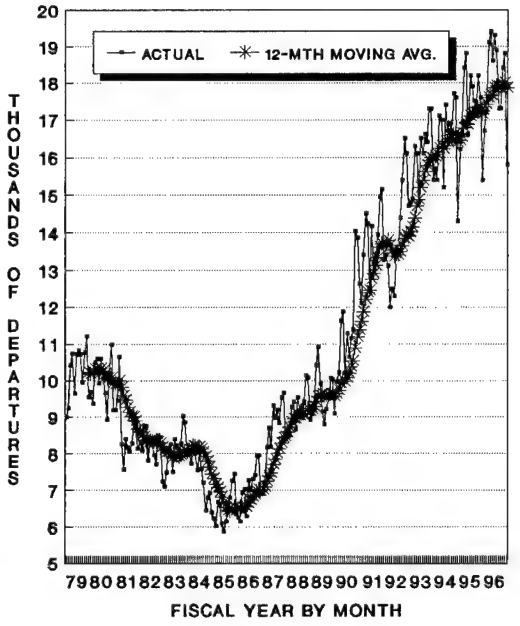
U.S. AIR CARRIER CAPACITY AND TRAFFIC TRENDS

INTERNATIONAL OPERATIONS - LATIN AMERICAN ROUTES

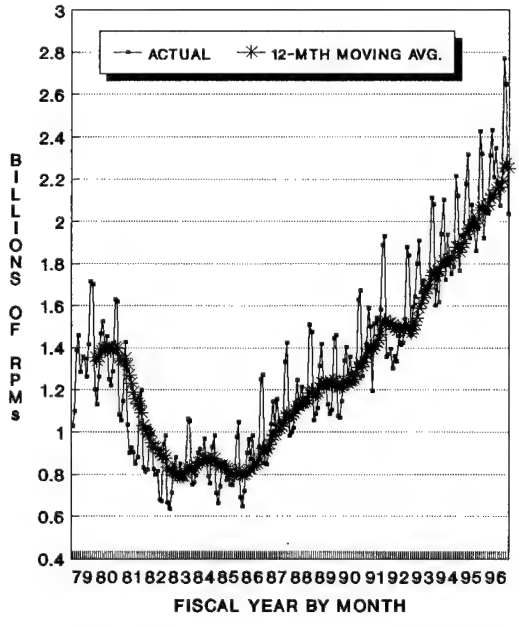
AVAILABLE SEAT MILLIONS



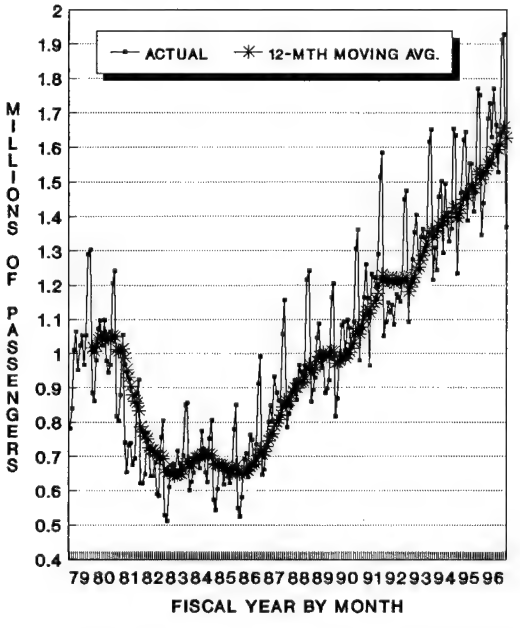
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS

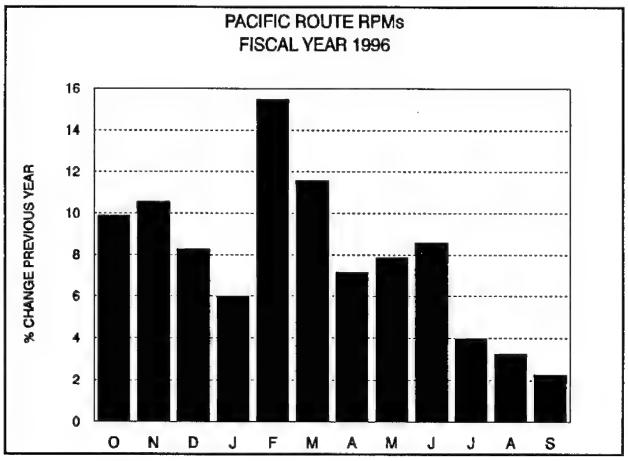


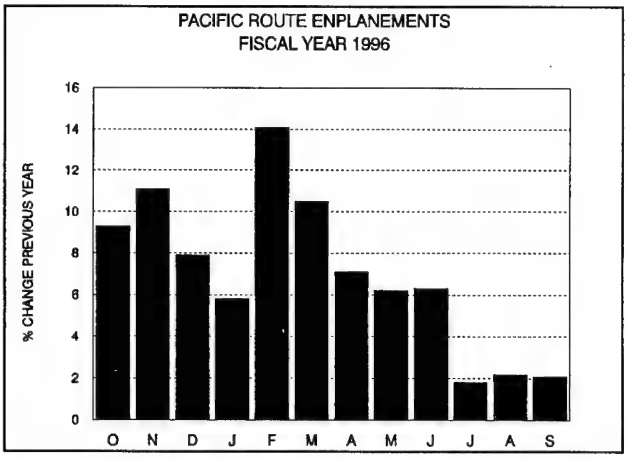
Pacific Routes

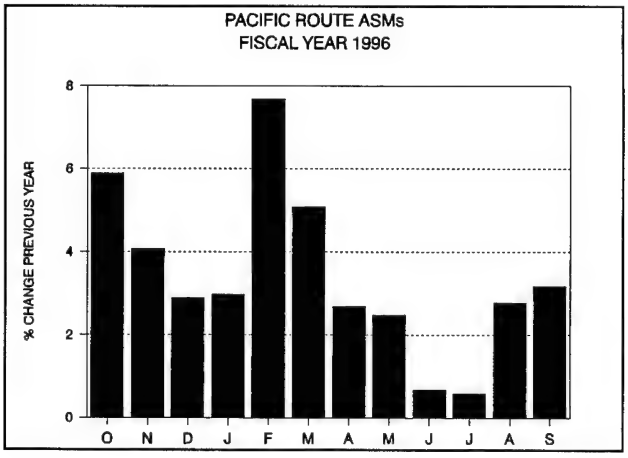
Passenger traffic to Pacific destinations again increased in 1996, continuing the reversal of declines experienced in 1993 and 1994. Passenger enplanements were up 6.7 percent, and RPMs increased 7.6 percent. During the period 1986 to 1996, RPMs and passenger enplanements increased about 200 percent, expanding at an average annual rate of about 11 percent. In 1996 RPMs increased at a faster rate than capacity (up 3.4 percent), increasing the load factor by 2.9 percentage points to 74.5 percent.

The Japanese economy was well on its way to full recovery in 1996, while the emerging Asian economies continued to experience rapid growth. The easing of monetary policy in Japan is expected to stimulate strong economic growth during the next several years. In addition, the developing Asian countries should continue to grow at rates well above most other regions of the world. Their share of world GDP is forecast to increase from 18 percent in 1984 to nearly 27 percent by 2000.

According to data filed by operating entity, the U.S. passenger carriers serving the market had an operating profit of $672 million in 1996, making the Pacific market the most profitable of the international entities.



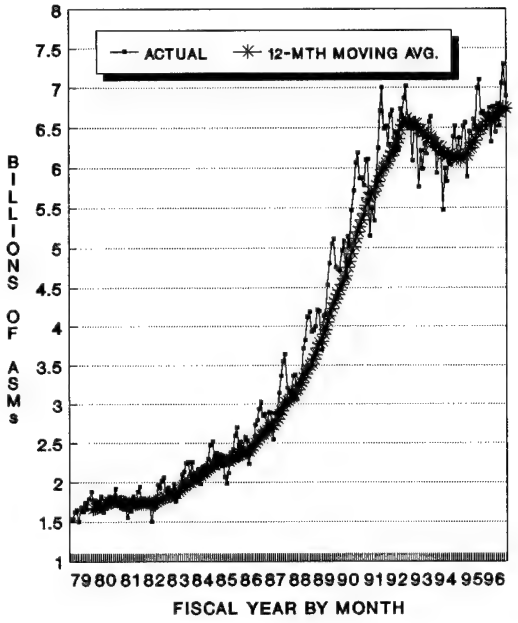




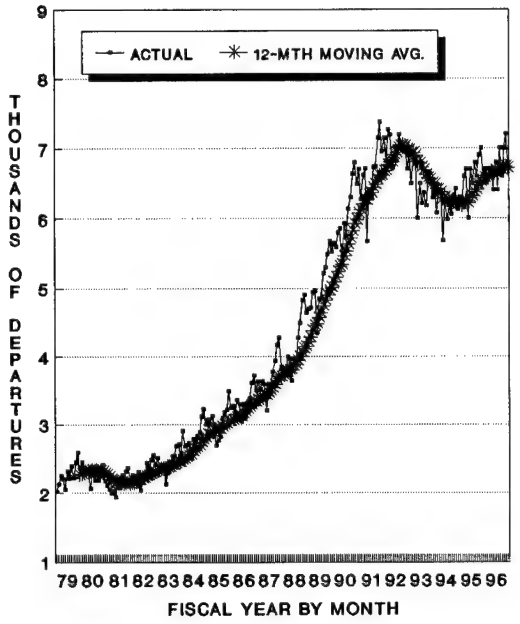
U.S. AIR CARRIER CAPACITY AND TRAFFIC TRENDS

INTERNATIONAL OPERATIONS - PACIFIC ROUTES

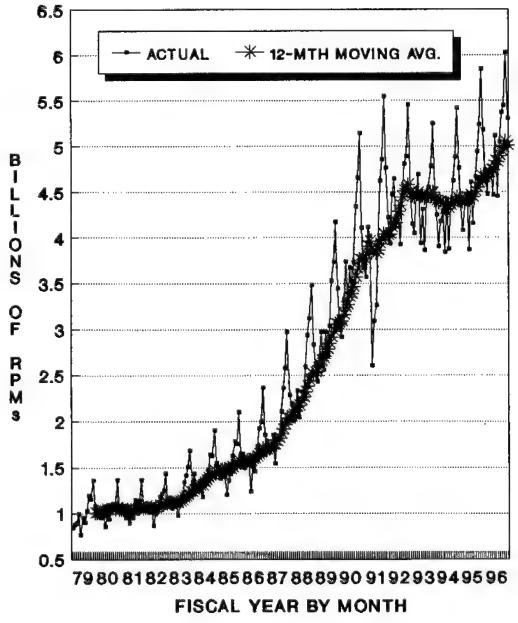
AVAILABLE SEAT MILES



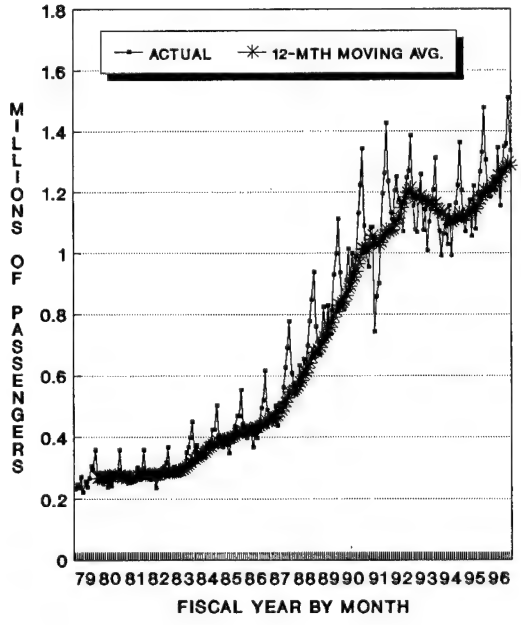
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS



NONSCHEDULED TRAFFIC AND CAPACITY

The number of nonscheduled (charter) passengers flying on U.S. commercial air carriers decreased 5.6 percent in 1996, to a total of 11.1 million. Domestic enplanements decreased 3.2 percent, while international enplanements declined 9.9 percent.

Nonscheduled revenue passenger miles and available seat miles both declined 6.9 percent. The nonscheduled load factor remained unchanged at 71.6 percent.

AIR CARGO TRAFFIC

Air cargo revenue ton miles (RTMs) flown by U.S. air carriers reporting on BTS Form 41 totaled 24.2 billion in 1996, up 4.2 percent from 1995. Domestic cargo RTMs (12.7 billion) were up 2.9 percent, while international RTMs (11.5 billion) increased 5.7 percent.

Freight/express RTMs (21.5 billion) increased 4.3 percent in 1996. This included 10.6 billion domestic RTMs (up 3.1 percent) and 10.9 billion international RTMs (up 5.7 percent). Mail RTMs (2.7 billion) increased 3.0 percent in 1996.

FORECAST ASSUMPTIONS

The background against which the present forecast is developed involves three major factors--changes in the economy, structural changes in the air carrier industry, and changes in the market for air transportation. The baseline forecasts of commercial air carrier traffic and activity during the next 12-year period (1997 to 2008) are made against an uncertain background, particularly with respect to the industry structure and changes in the market.

THE ECONOMIC OUTLOOK

Chapter II discusses the economic assumptions in detail. In general, continued economic growth along with modest inflation, declining real fuel prices, and declining passenger yields, both domestically and internationally, should provide a strong base for air travel in both the business and leisure travel markets.

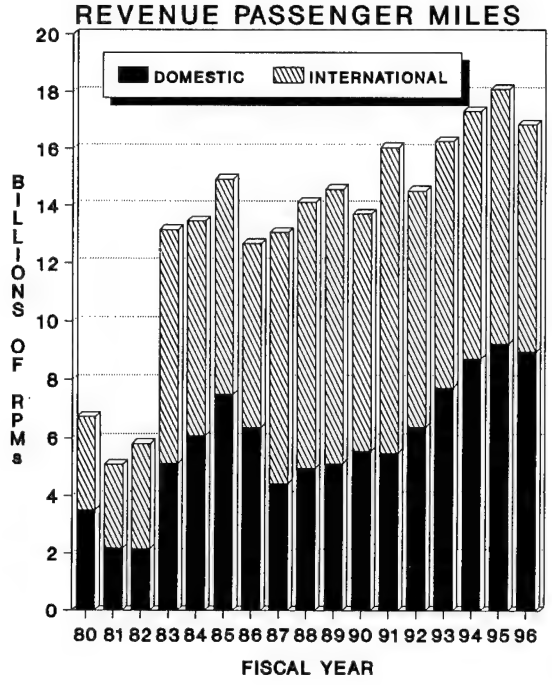
The economy continues to expand, corporate profits are strong, stock market prices are at record levels, and the unemployment rate is declining. While downsizing in a number of companies will continue in the near future, total employment is increasing. In addition, corporate travel budgets have expanded, along with improved business profits.

One major concern for the future, however, involves stagnating middle-class incomes and the growing inequality in the distribution of income. Clearly, these trends could significantly impede the growth of future air travel. Whether we look at broad or narrow aggregate measures of income, or evaluate the data by experience, age, or education, the results point in the same direction--erosion of middle-class purchasing power.

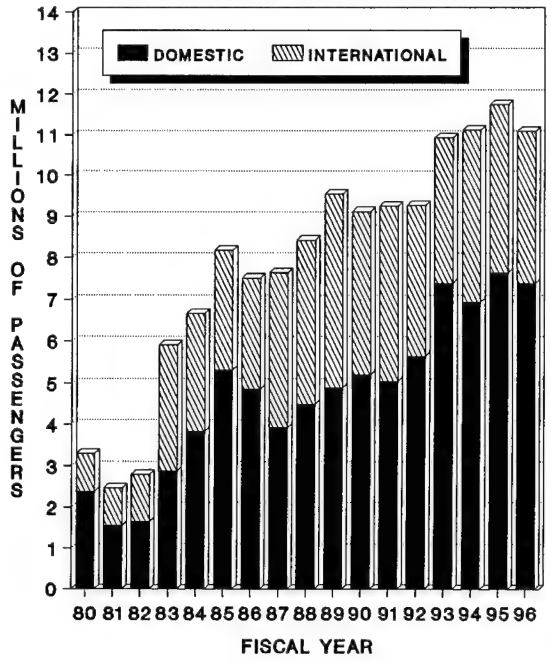
The rate of growth in the Labor Department's Employment Cost Index, which measures workers' earnings (wages and salaries and benefits), has been declining steadily since the early 1980s. For the year ended in September 1996, earnings increased 2.8 percent, about the same as the increase during the 12-month period ended September 1995. During the last 2 years, the yearly increases have been the smallest recorded since the series began in CY 1981.

U.S. AIR CARRIER NONSCHEDULED TRAFFIC

REVENUE PASSENGER MILES

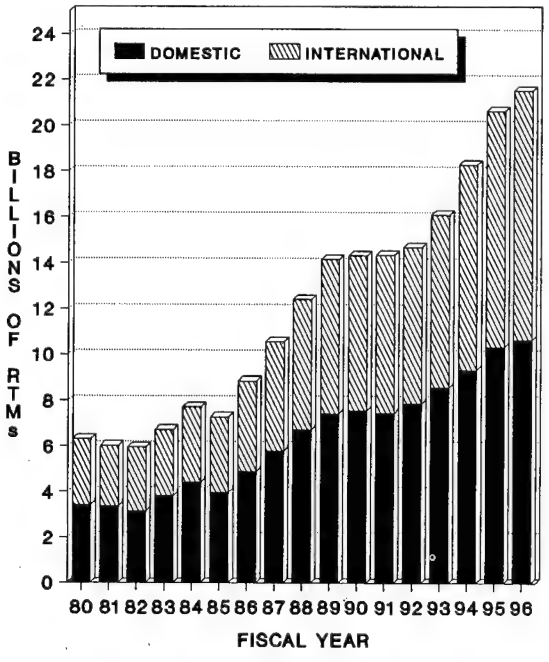


PASSENGER ENPLANEMENTS

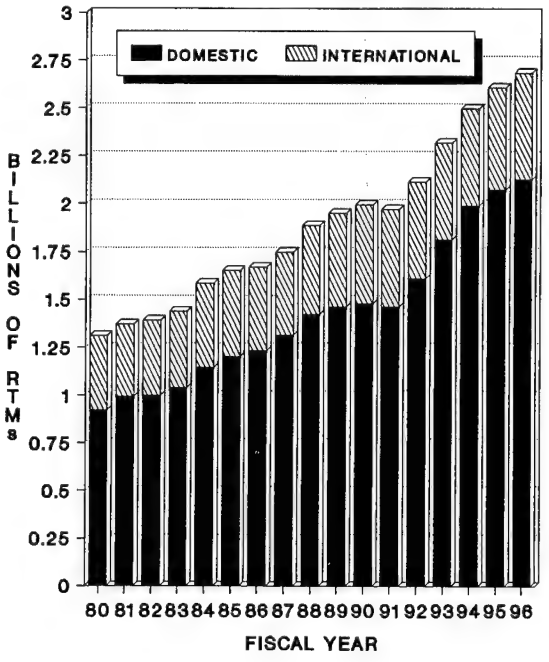


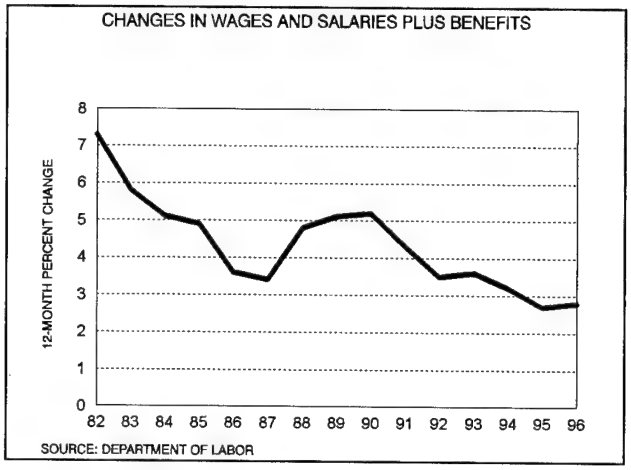
U.S. AIR CARRIER AIR CARGO TON MILES

FREIGHT/EXPRESS TON MILES

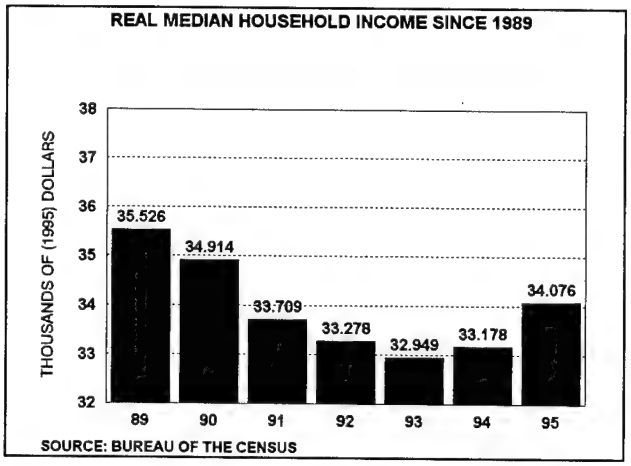


MAIL TON MILES

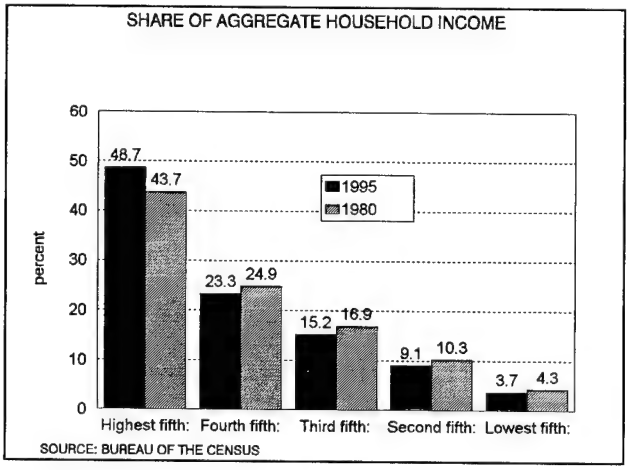




In September, the Bureau of the Census reported that the real median income of households in 1995 increased 2.7 percent from 1994 levels. Although the most recent recessionary period ended in March 1991, household income in 1995 has not yet recovered to its 1989 pre-recession peak.



Bureau of the Census data also showed that the income distribution is becoming more skewed, and that middle-income families are losing ground. The top fifth of the nation's households received 43.7 percent of total aggregate income in CY 1980. In 1995 the percentage increased to 48.7 percent. During the same period, for the middle-income range, the third and fourth quintile percentages dropped from 16.9 to 15.2 percent and from 24.9 to 23.3 percent, respectively. Moreover, the richest 5 percent increased their share of total income from 15.8 to 21.0 percent.



The Gini Index, another measure of income inequality, was 12.8 percent above its CY 1996 level. *The index measures how the actual distribution of U.S. income deviates from a uniform distribution. A uniform income distribution is one where the percentage of the population within a particular grouping equals the percentage of the total income received. For example, this distribution implies that the lower and upper 5 percent of the population each receive 5 percent of the aggregate income. The Gini index can range from 0 indicating perfect equality to 1 indicating perfect inequality.*

A report entitled, "A Brief Look At Postwar U.S. Income Inequality," published by Commerce Department's Census Bureau in June 1996, also showed--using five different indicators to measure the money distribution of households--a significant increase in income inequality between 1986 and 1994.

In summary, the shift in the income distribution is forcing the middle-class to spend an ever increasing share of its earnings on necessities. It has been estimated that this share has increased from 33.4 percent a decade ago to almost 50 percent today. Declining incomes available for discretionary spending--in the long-term--may reduce the demand for pleasure travel.

INDUSTRY STRUCTURE

Two related elements of the industry structure are creating pressures toward lowering costs. First, a wave of entry is under way, fueled in part by the financial success of Southwest Airlines. New entrants ensure that competitive forces remain strong, and new entrants will remain a factor in the industry. The benefits to the American consumer brought about by new low-cost, low-fare airlines have been substantial. A recent report by the Department of Transportation estimated that consumer savings due to low-cost service are now $6.3 billion annually.

Second, many high-cost carriers are restructuring in an attempt to reduce their unit costs to the levels achieved by the most efficient airlines. The restructuring includes route realignments, reducing service or withdrawing from unprofitable hubs, and seeking work rule changes and wage concessions. For example, in 1994 Delta announced its "Leadership 7.5" cost-cutting and restructuring program, and in 1996 introduced a new low-cost carrier--Delta Express. Also, in an attempt to reduce costs, United started a low-cost no-frills service on the West Coast in 1994, and became the world's largest employee-owned corporation.

The forecast assumes only limited additional industry concentration. The last merger to occur among the majors was Southwest Airlines with Morris Air in 1994. We expect similar types of mergers to occur over the forecast period, with new viable carriers emerging from the large number of new-entrant carriers. However, a merger between major carriers, such as that being discussed between Continental and Delta, could usher in a new wave of consolidations. Clearly, this could significantly alter the structure of the industry and have a far reaching effect on our forecasts.

The development of "two-tier" airlines such as USAir's low-cost service, United's West Coast shuttle service, and Delta's new airline (Delta Express, which is structured for unit costs below 7.5 cents) have created an additional dynamic force in the industry. If these new operations are successful, additional carriers may attempt to lower their costs and increase their product differentiation by moving in this direction.

Another factor that might influence developments among the major carriers is the trend toward employee ownership of majority interests in major carriers. In 1994, United Airlines employees acquired ownership of a majority of the parent firm, UAL Inc. While the immediate impacts of this change in ownership are not clear, there are changes in incentive and employee outlook implied by this type of arrangement. The ramifications are positive for the basic goal of lowering the cost structure of the larger major carriers. Wide extension of employee ownership programs could have a major impact on the operations and cost structure of the industry.

The current system of bilateral agreements, which started back in the 1940s, severely restricts competition in international markets. It is well known that heightened competition can improve efficiency, productivity, and worldwide economic growth. At the present time, the U.S. DOT is attempting to create a more competitive international aviation environment for the U.S. airlines through the development of open-skies agreements.

In February 1995 the U.S. signed an open-skies agreement with Canada. The goal of the agreement is full open air service, after a 3-year phase-in period limiting U.S. carriers access to Toronto, and a 2-year phase-in period for Vancouver and Montreal. Estimates of the value of the agreement to the economy have been in the range of $15 billion per year. Agreements have also been reached with 11 European countries, and discussions concerning the liberalization of markets are pro-

ceeding with other countries in Europe, Asia, and Latin America. The expansion of these agreements over the next several years could significantly increase the level of activity of the more efficient U.S. carriers vis-à-vis foreign flag carriers.

The industry is expected to continue toward globalization, through code-sharing agreements. The number of transatlantic alliances have recently been increased by Delta's association with Austria, Sabena, and Swissair. Further, Delta and Continental have preliminary agreements with Air France, and American and British Airways have proposed a strategic alliance. Other existing major network alliances include associations between Northwest and KLM, and United and Lufthansa. While strong international alliances are high on the list of industry needs, the immediate major priorities appear to involve labor issues, ownership, and cost control.

In summary, the industry is dynamic, with new entrants, restructuring, new low-cost options on the part of existing carriers, and the possibility of a number of mergers and international agreements. All of these forces could increase air carrier efficiency, reduce unit costs and fares, and stimulate air travel.

MARKET CHANGES

Some of the major reasons for the dynamic state of the industry are the ability of air carriers to more closely adjust supply and fares to maximize revenues; the growth of competition by low-cost carriers; the move by the large air carriers to restructure and reduce unit costs; and declining real fares. Other important factors are the increasing sensitivity of business travelers to the cost of the air trip due to the expansion and availability of alternatives, and the significant growth in the leisure market. As the total demand for air travel becomes more price elastic, it is imperative that costs and fares continue to decline in order to expand the scope of the market and increase operating revenues.

Business travel, in the long-term, will be impacted by improvements in communication technologies, such as facsimile machines, computer interfaces, and teleconferencing. If, in fact, real expenditures on business travel begin to slow or decline, the market will rely more heavily on non-business demand as the communications revolution continues to change the way business is conducted.

The future development of video/computer conferencing is another force on the horizon that could change business travel patterns. The much heralded "information highway" will allow a video and data link between two or more individuals or groups so that video images, voice, and data can be exchanged in real time. This capability may limit the future expansion of business travel. While it will always be necessary to conduct face-to-face meetings, innovative new technologies such as videoconferencing could substitute for many of today's business trips.

In summary, leisure travel, which is highly price sensitive, will be more important in the future. And as businesses demand more efficiency and their alternatives to air travel increase, they will also become more sensitive to relative price changes.

It seems an inescapable conclusion that cost efficiencies must be achieved to keep fares low, create stable demand growth, and provide the industry with acceptable rates of return on capital. These are the fundamental assumptions of the forecasts that follow.

MODELING DOMESTIC RPMS AND ENPLANEMENTS

The model used for developing FAA domestic commercial air carrier forecasts relies upon a system of statistical and deterministic equations. The pivotal equation of the system relates RPMs to two primary independent variables--GDP and yield--both adjusted for inflation. Enplanements are derived by dividing the projections of RPMs by average trip length, which is determined exogenously.

During the pre-deregulation era, prices were set by the now defunct Civil Aeronautics Board, and generally did not respond to shifts in demand and/or supply. Therefore, single-equation least squares methods were adequate for forecasting domestic RPMs. Market forces quickly took hold following deregulation in 1978. To adjust for the jointly dependent variables in demand and supply equations, two-stage least squares were used to estimate the demand equation for the period 1979 through 1996. The primary exogenous variable specified to estimate the independent variable, real yield, was operating costs per available seat mile.

This year, the Bureau of Economic Analysis changed its method of estimating real GDP. It now uses a chain-weighted method rather than fixed weights. The new chained (1992$) GDP series was used to reestimate the parameters of the two-stage least squares model for forecasting RPMs. Although the same explanatory variables were used in the model, the structural form and parameter estimates changed to account for the revised growth rates of the historical GDP series.

It is important to note that the GDP projections presented in this document and its relationship to traffic growth should not be compared to previous FAA projections.

Projections of the variables, GDP and yield, along with a detailed discussion of the estimation changes in GDP are presented in Chapter II and in the following sections.

Other measures of income and demographic variables were tested in the aggregate domestic RPM equation to determine if we could improve the fit and/or adjust for collinearity problems. The other measures of income were personal income per capita and median family income. These variables, along with population and yield, were used to estimate the parameters of the domestic RPM equation. The results from both equations using either measure of income were consistent with the use of GDP as the measure of economic activity. Further, the forecasts of aviation activity using the two different formulations were not significantly different from those constructed using only GDP and yield.

Although it is aggregate RPMs that we forecast, it would be preferable to use different models to estimate the two distinct components of each market--business and personal travel. A further refinement would distinguish the long-haul from the short-haul market. This approach would provide important information for developing public policy and would most likely improve the accuracy of the forecasts. Clearly, these markets are affected by different sets of variables, and adjust at different rates to them.

For example, most experts in the industry would agree that the price elasticity of demand for business travel differs markedly from the price elasticity of demand for pleasure travel. Furthermore, theory would suggest that industry profits should be a factor in determining business travel, and that some measure of personal or family income is a variable affecting pleasure travel. At this time, however, the lack of an adequate data base on RPMs subdivided into these four components precludes the development of accurate forecasts for each market at the national level. Additional research and data collection are necessary to advance this approach.

MODELING TOTAL AND U.S. FLAG CARRIERS' INTERNATIONAL RPMS AND ENPLANEMENTS

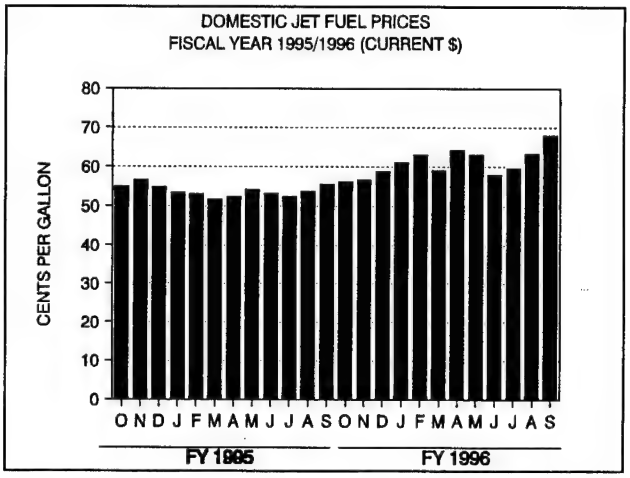
A new system of statistical and deterministic equations was developed for forecasting U.S. flag carriers' international RPMs and enplanements by region--Atlantic, Pacific, and Latin America. Initially, the parameters of a gravity model were estimated, which relates total passengers (U.S. and foreign flag carriers) in each world region to the region's GDP and U.S. GDP. Secondly, projections of U.S. and regional GDP along with assumptions concerning U.S. market share in each region were used to forecast U.S. flag carriers' international enplanements. The forecasts of enplanements along with assumptions concerning average trip length were then used to derive U.S. flag carriers' international RPM projections. This approach ties U.S. flag carrier activity in the international regions to total demand and should, over the long-term, produce more accurate workload and trust fund revenue forecasts.

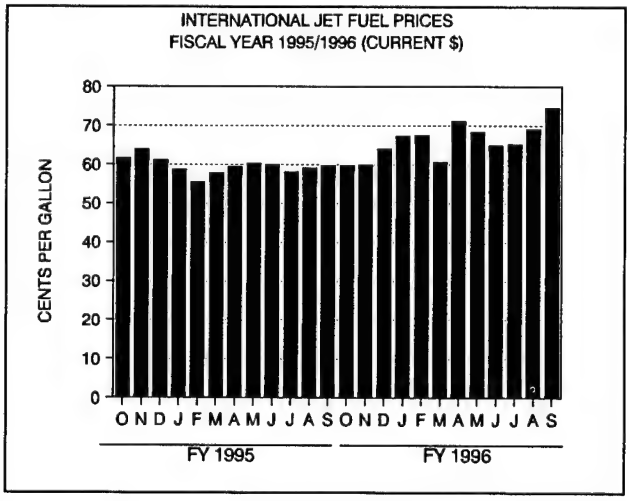
OTHER VARIABLES AND ASSUMPTIONS (U.S. AIR CARRIERS)

In addition to the industry and economic variables discussed above, FAA's forecast approach involves specific review of independent variables that influence the forecast. The principal variables are the cost of jet fuel for air carriers, which is a major component of operating costs and a determinant of yields, and the yields that we expect air carriers to obtain.

JET FUEL PRICES

During 1996, jet fuel prices showed significant increases. Fuel costs averaged 62.5 cents a gallon in 1996, with the average 61.2 cents for the domestic purchases and 66.3 cents for international. The system price was 12.4 percent higher than the average paid in 1995.



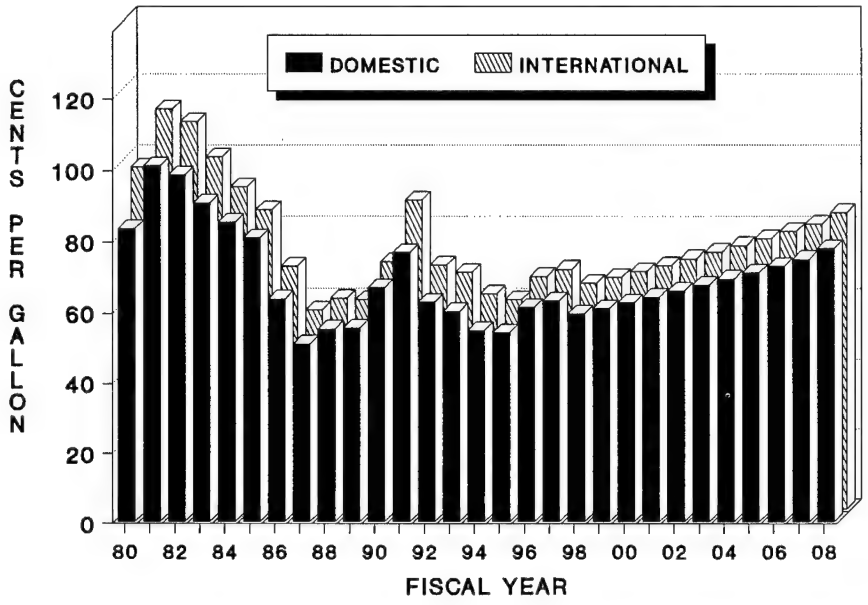


During the fourth quarter of 1996, system fuel prices increased over 20 percent. However, for the remainder of the fiscal year, it is expected that increases in the availability of world oil supplies will dampen the acceleration of prices.

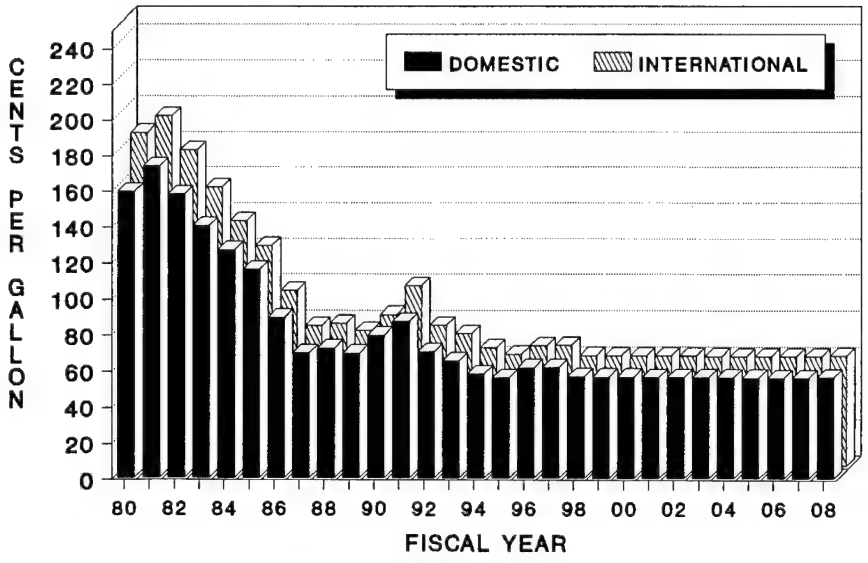
System jet fuel constant dollar (1996$) costs are expected to increase 0.3 percent to 62.7 cents in 1997, and then decline 8.3 percent in 1998 to

U.S. COMMERCIAL AIR CARRIERS

JET FUEL PRICES - CURRENT DOLLARS



JET FUEL PRICES
CONSTANT (FY-1996) DOLLARS



57.5 cents. For the remainder of the forecast period, real fuel prices are expected to remain relatively constant, reaching 57.2 cents in 2008. Jet fuel price stability will be an aid to the industry in achieving continued long-term growth and financial stability. The forecast of fuel prices (current$ and 1996$) is shown in Chapter IX, Tables 6 through 8.

PASSENGER YIELDS

During the period 1969 through 1978 yields were relatively stable. Real yields averaged 21.48 cents with a standard deviation of only 1.00 cent. Since 1978 there has been a steady decrease in real yield, with the causes of the decrease changing, but always with the result that fares have moved downward. By 1996 the average real yield had fallen to 13.08 cents per mile, an average yearly decline of 2.2 percent. In the 1970s the dominant reason for the decrease was the introduction of large numbers of more efficient jet aircraft into the fleets operated by air carriers. In the 1980s the continued decrease was fueled by the deflationary impact deregulation had on the industry. Not only were airlines able to rationalize their route structures, but labor costs decreased.

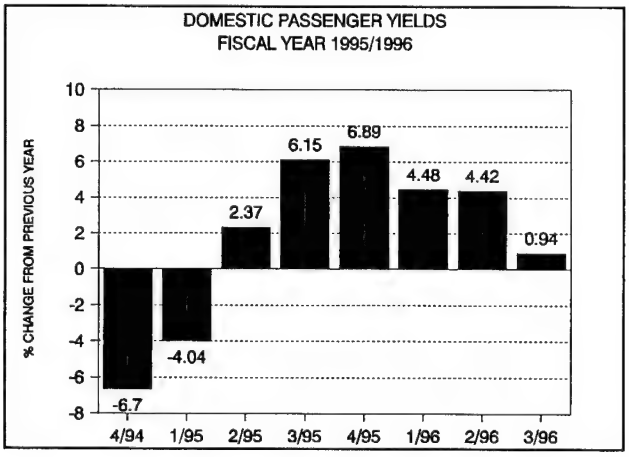
Financial weakness of the industry in the early 1990s, coupled with high levels of capacity relative to demand, and the growth of new-entrant low-cost carriers has brought about intense fare competition. The highly competitive markets are pushing high-cost carriers to restructure, increase productivity, and lower unit costs. We expect this trend to continue for the next several years.

Lower airline cost structures and competition from new-entrant carriers should result in relatively large declines in real yields through 1998. For the remainder of the forecast period we expect real yields to continue to decline, but at a slower rate. Domestic yields are expected to fall at a much faster pace than international yields.

On a system basis, real yield is expected to decrease 2.4 percent in 1997 and 2.2 percent in 1998. For the entire forecast period, real yield is expected to drop from 13.08 cents in 1996 to 11.56 cents in 2008, declining about 1.0 percent a year.

Domestic Passenger Yields

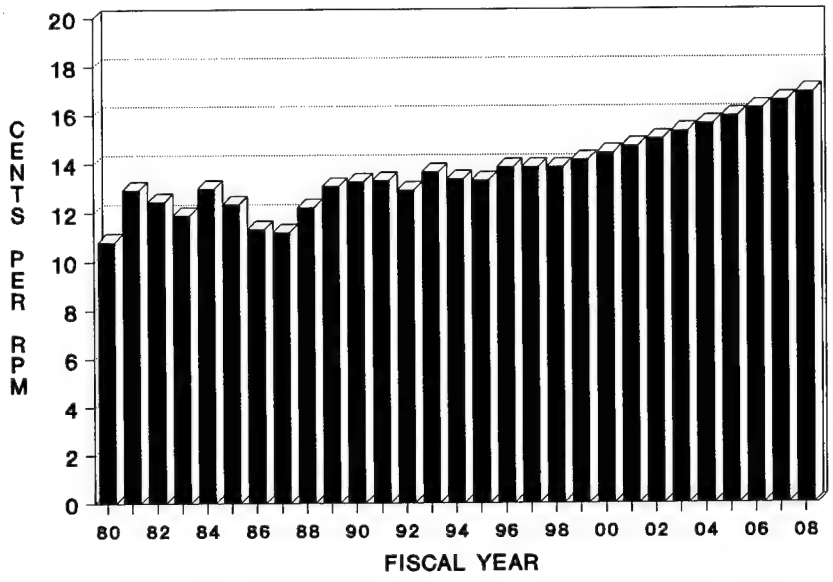
Following declines of nominal yield in the fourth quarter 1994 and the first quarter of 1995, domestic yields strongly rebounded in the second quarter of 1995 through the third quarter of 1996. Overall, for 1996, current dollar yield (13.86 cents) increased 4.1 percent, while real yield increased 1.3 percent--the first increase since 1993. In 1995 nominal yield declined 0.4 percent and real yield dropped 3.2 percent.



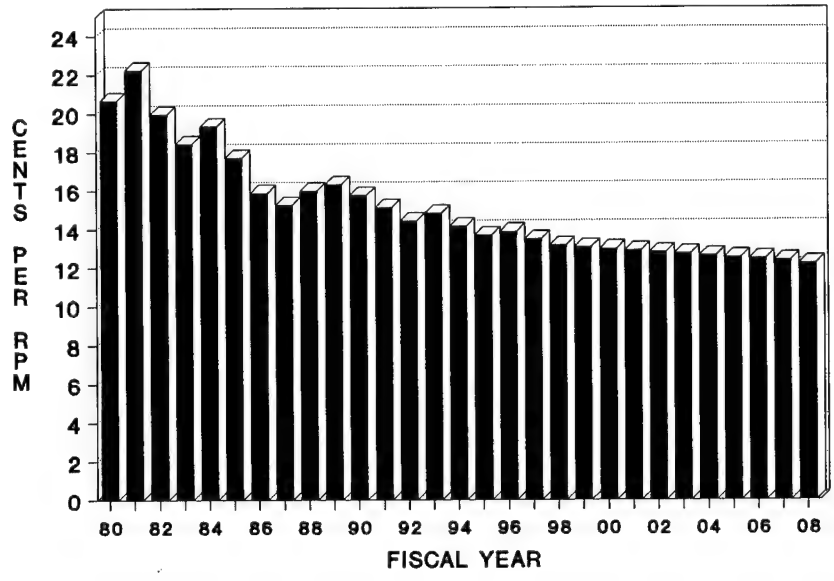
From 1969 to 1978, domestic real yield decreased 1.8 percent per year. For the period 1978 through 1996, the decline was 2.0 percent per year. Over the forecast period, we expect that competitive forces and industry improvements in efficiency and productivity will continue to push real yields down. For the forecast period, we project a 1.1 percent annual

U.S COMMERCIAL AIR CARRIERS
DOMESTIC PASSENGER YIELD

CURRENT DOLLARS



CONSTANT (FY-1996) DOLLARS



decrease in real yield. Current dollar or nominal yield will remain unchanged in 1997 and 1998, and then increase at an average rate of 1.7 percent per year, reaching 16.90 cents in 2008.

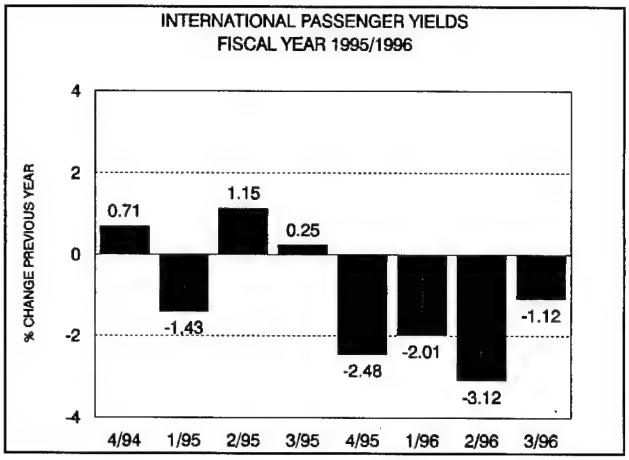
For the forecast period it is assumed that the 10 percent ticket tax or user fees (which generate similar revenues), both of which will be passed on to the passengers, will be implemented to finance the airport and airway system. Further, it is assumed that these charges will not affect the air carriers pricing decisions in the short- and long-term.

International Passenger Yields

The setting of international fare levels differs from the domestic process in that many international fares must meet International Air Transport Association (IATA) guidelines and/or be approved by foreign governments.

There has been a long-term decrease in international real yield similar to that in the domestic industry (and for similar reasons). Real international yields decreased an average of 1.8 percent per year from 1969 to 1978 and an average of 2.7 percent per year from 1978 to 1996. Real yields in the international market are generally lower than in the domestic market, primarily because operating costs tend to be lower in these markets. These lower costs are associated with longer average stage length internationally and with the use of larger aircraft, which tend to have lower seat mile costs.

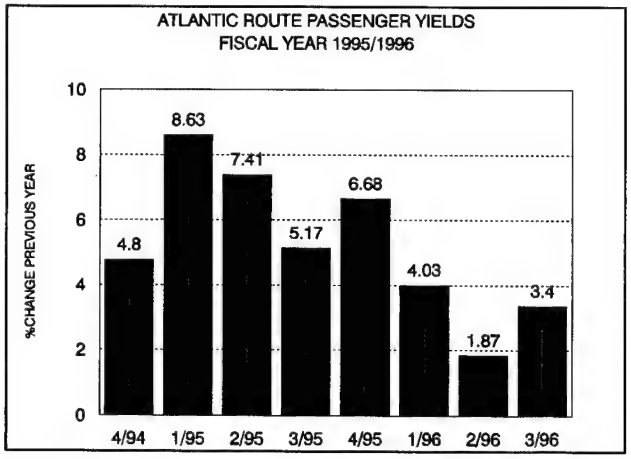
It is assumed that the international markets have additional efficiencies to allow continued decreases in real yield in the future. These efficiencies could be achieved through expansion of deregulation, privatizing of carriers, and more open-skies agreements. The total international real yield is expected to decrease 1.1 percent in 1997, then to decrease about 0.6 percent per year through the forecast period. Current dollar yield is expected to increase 2.1 percent yearly, from 10.93 cents in 1996 to 14.02 cents in 2008.



The individual market yield projections are shown in Chapter IX, Table 9.

Atlantic Routes

In 1996, the major U.S. carriers on the transatlantic routes were American, Delta, and United. Current dollar yield (10.25 cents) increased 3.7 percent, while real yields in the market increased 0.9 percent. This followed an increase of 3.4 percent increase in real yield in 1995.

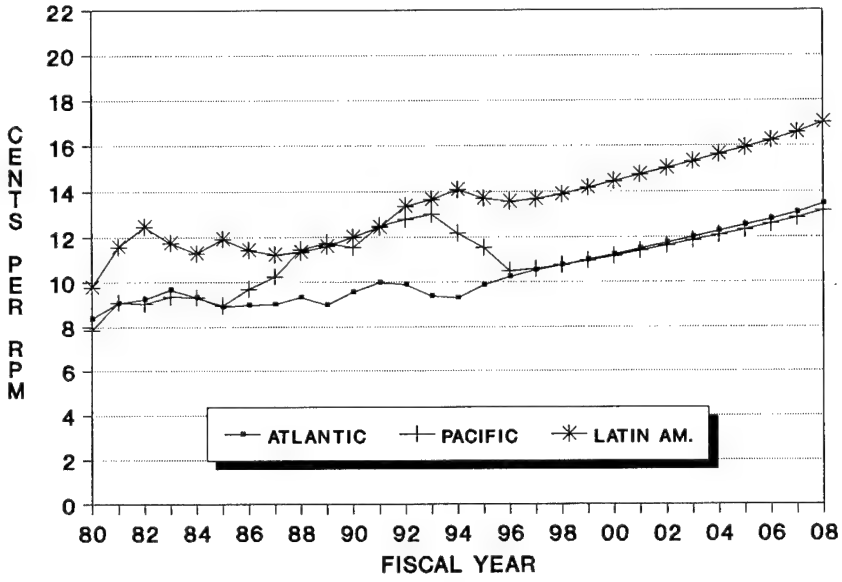


Real yield in the Atlantic segment of the international market is expected to remain unchanged

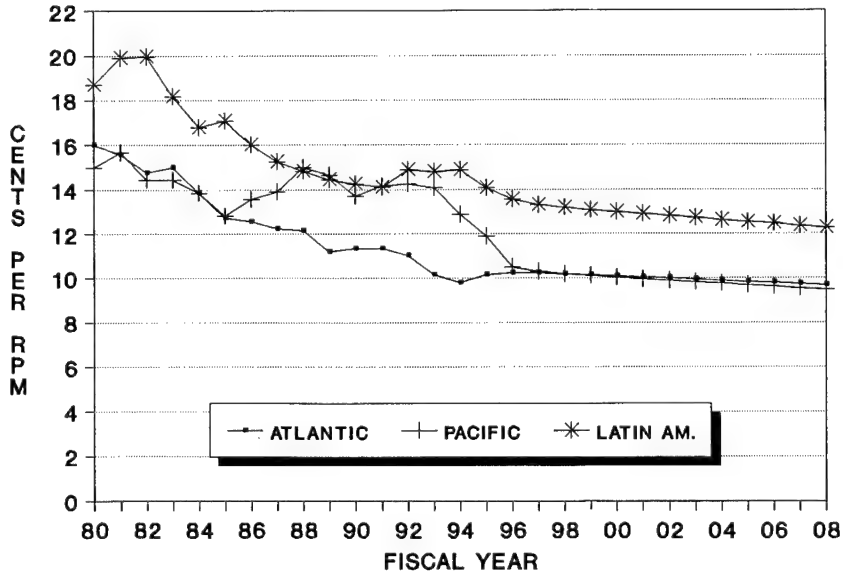
U.S COMMERCIAL AIR CARRIERS

INTERNATIONAL PASSENGER YIELD

CURRENT DOLLARS



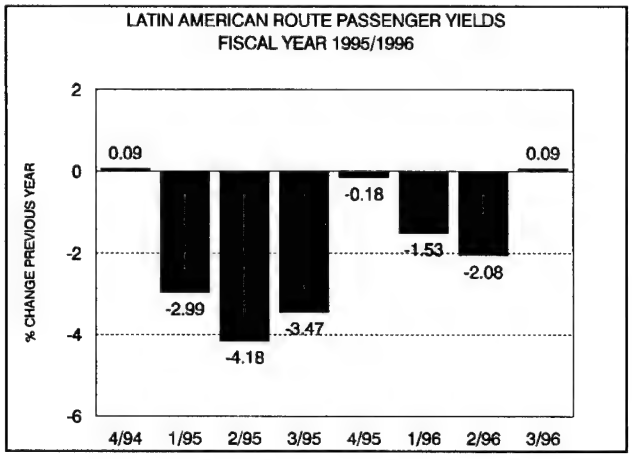
CONSTANT (FY-1996) DOLLARS



in 1997. For the balance of the forecast period, real yield is forecast to decline at an average yearly rate of 0.5 percent. Nominal yields are expected to increase at an annual rate of 2.3 percent , reaching 13.44 cents in 2008.

Latin American Routes

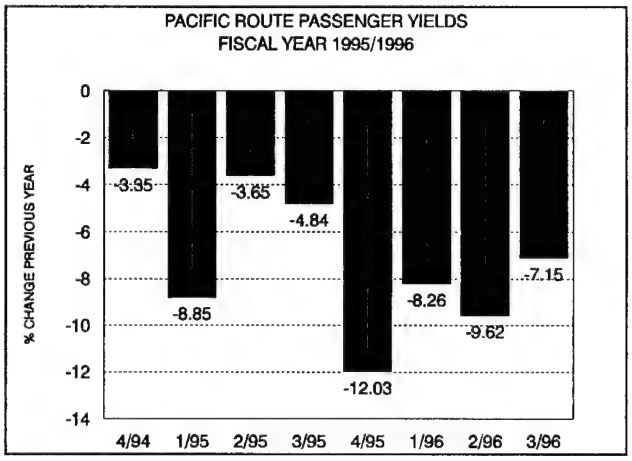
In 1996 Latin American current dollar yield (13.57 cents) decreased 0.9 percent, while real yield fell 3.7 percent. In 1995 nominal yield and real yield decreased 2.7 percent and 5.4 percent, respectively. For the period 1978 through 1996 real yield declined at an annual rate of 1.7 percent.



We expect real yield to continue to decline through the forecast period at a rate of 0.8 percent a year. Nominal yields are forecast to increase at an annual rate of 1.9 percent a year, reaching 17.01 cents in 2008.

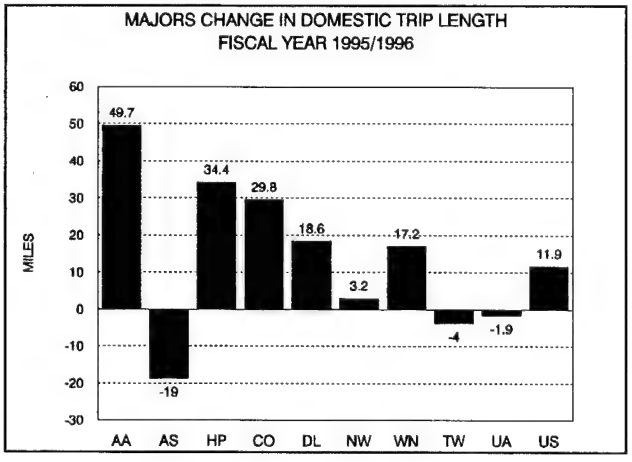
Pacific Routes

Current dollar yield in the Pacific markets decreased 9.1 percent in 1996, and real yields declined 11.6 percent. *Yields declined, in part, due to bookkeeping changes instituted by Northwest and Delta in CY 1994 and 1995.* The forecast period is expected to show real yield declining at an average annual rate of 0.8 percent. Nominal yield is forecast to grow an average of 1.9 percent per year during the same period, increasing from 10.50 cents in 1996 to 13.16 cents in 2008.



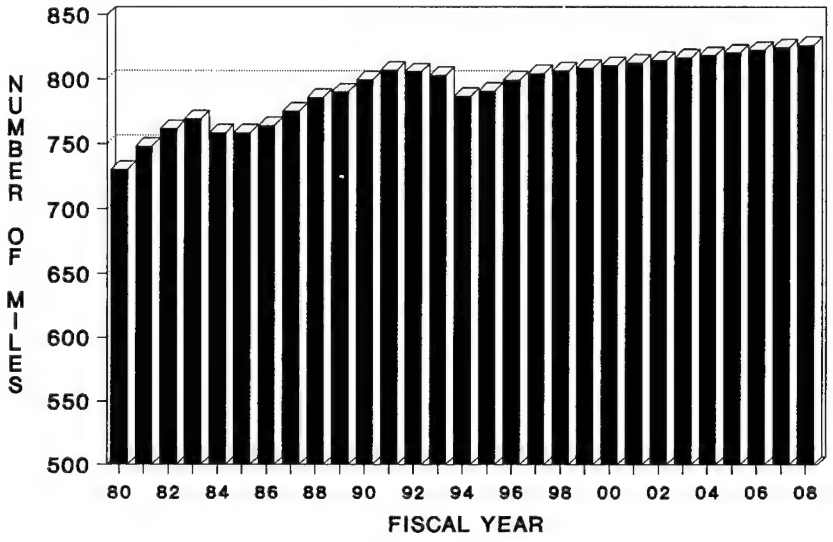
PASSENGER TRIP LENGTH

The average system passenger trip length (992.6 miles) increased by 7.1 miles in 1996. The domestic passenger trip length increased about 8.4 miles, primarily due to some of the majors eliminating short-haul markets and/or turning these markets over to their code-sharing regional partners. In 1996, seven out of the 10 majors increased their trip lengths, while the average domestic trip length for all majors increased more than 13 miles.

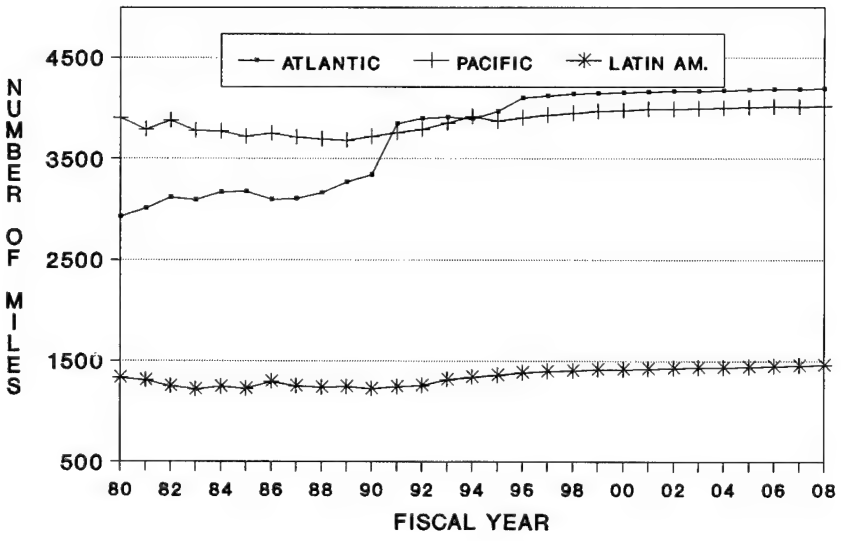


U.S COMMERCIAL AIR CARRIERS
PASSENGER TRIP LENGTH

DOMESTIC



INTERNATIONAL



Average system trip length is forecast to increase by 6.7 miles in 1997 and 4.0 miles in 1998. Over the entire forecast period, trip length is forecast to increase by about 5.0 miles per year, continuing the historical upward trend. The trends are shown graphically on the following page and in Tables 6 through 8 in Chapter IX.

Domestic trip length is projected to increase over the forecast period due to the continued realignment of routes by the majors, and a change in the reporting status of two carriers--Business Express (292.4 miles trip length) and Mesa (247.7 miles). *These carriers, who reported on Form 41 in 1996 will report on Form 298C in 1997.* In 1997 and 1998 domestic trip length increases 5.2 and 2.0 miles, respectively. For the entire forecast period, we expect average trip length to increase at approximately 2.0 miles per year.

Due to more direct flights and expanded service into central and eastern Europe, deep South America, and China, the trip lengths in individual international markets are expected to increase:

- Atlantic trip length increases from 4,102.8 miles in 1996 to 4,192.8 miles in 2008.
- Latin American trip length increases from 1,384.6 miles in 1996 to 1,458.6 miles in 2008.
- Pacific trip length increases from 3,904.5 miles in 1996 to 4,019.5 miles in 2008.

AVERAGE AIRCRAFT SIZE

Between 1978 and 1983, the average system seating capacity of aircraft used by U.S. commercial air carriers increased by almost 20 seats (from 147.2 to 167.1 seats). Between 1983 and 1992, however, the average seating capacity of the U.S. fleet remained surprisingly stable, standing at 168.3 seats in 1992, up only 1.2 seats from 1983.

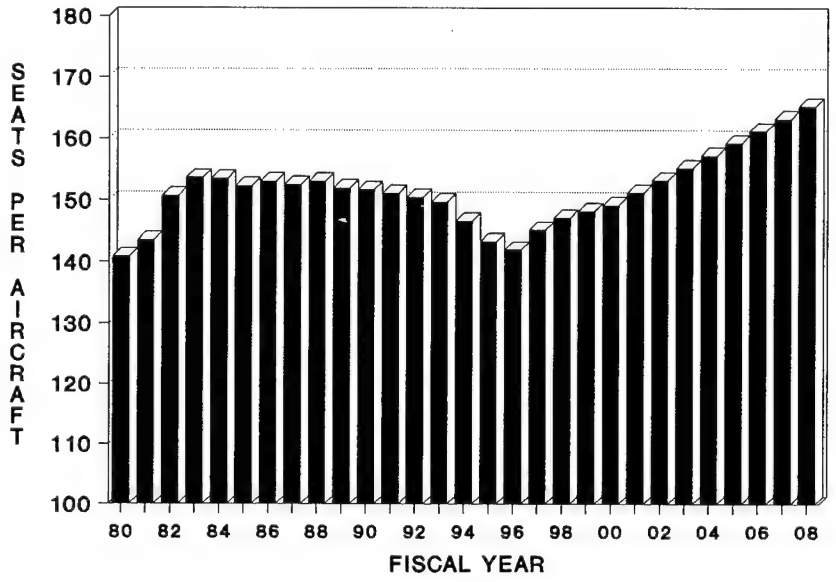
For the domestic fleet between 1983 and 1992, the average number of seats remained relatively stable at approximately 152 seats. Further, the average yearly change was only 0.6 seats. From 1993 through 1996, domestic seating capacity fell 7.7 seats--the largest decline observed over the past 20 years.

The large increase in domestic short-haul traffic by carriers using smaller aircraft (Valujet, Reno Air, etc.) has been only partly responsible for this phenomenon. The most likely cause of the big decline in the average number of seats is the increased number of regionals/commuters reporting on Form 41. If regionals/commuters operate one aircraft over 60 seats, even though most of their aircraft are under 60 seats, they must report all traffic statistics on Form 41.

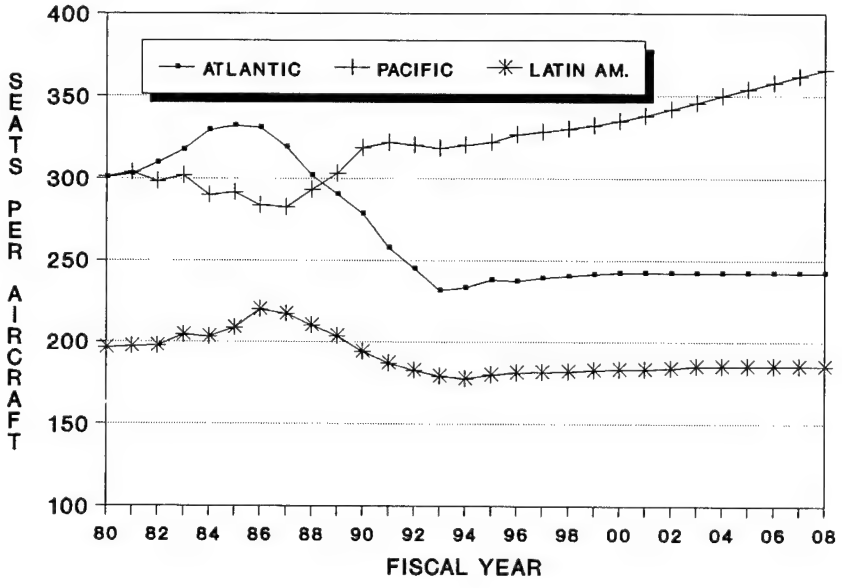
To test this hypothesis, we recalculated the number of seats for the domestic fleet for the period 1992 through 1996 without the regional carriers, whose average seating capacity for the period was 35 seats. These carriers generally operate in short-haul markets with turboprop aircraft. For the period, excluding the regional carriers, average yearly seating capacity is about 5.7 seats higher. We expect that continued strong growth in the short-haul markets, along with Business Express (35.1 seats) and Mesa's (24.4 seats) change in reporting status from Form 41 to 298C, will increase the average seating capacity throughout the period.

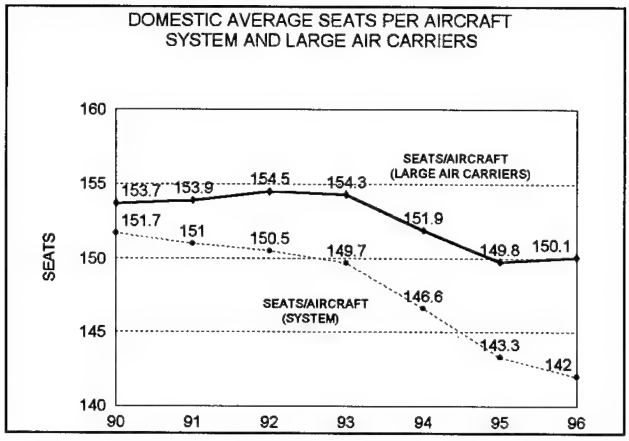
U.S COMMERCIAL AIR CARRIERS
SEATS PER AIRCRAFT

DOMESTIC SERVICE



INTERNATIONAL SERVICE





Legislation requires stage-2 aircraft to be removed from the U.S. fleet by January 1, 2000. This legislation should result in the retirement and or retrofitting of a significant number of the smaller stage-2 fleet. This, added to the fact that the aircraft being delivered to the U.S. fleet are generally larger than the ones being replaced, should result in an increase in the average seating capacity throughout the forecast period.

The forecast assumes that the average seating capacity of the U.S. commercial airline fleet will increase by about two seats per year. The history and forecast of average seat size is shown graphically on the following page and in Tables 6 through 9 of Chapter IX.

PASSENGER LOAD FACTOR

U.S. scheduled air carriers recorded a system-wide load factor of 68.8 percent in 1996, up significantly from the previous peak of 66.8 percent reached in 1995. The major unknown that will influence the near-term load factor is the capacity plans of the major carriers. Most carriers have made dramatic changes over the last few years in their equipment plans, particularly with respect to delivery of equipment during the next several years. Deliveries less retirements define the fleet changes for airlines.

One must consider load factor assumptions in the context of demand and capacity constraints. The forecast assumes a 5.1 percent increase in traffic in 1997 and a 4.8 percent increase in 1998. Normally, it is assumed that available seat miles will be adjusted in response to changes in demand, thereby resulting in a "normal" load factor. However, if capacity does not go up as quickly, as many think, load factor may increase.

Looking at 1997, capacity is forecast to increase 3.9 percent and RPMs are projected to expand 5.1 percent, which results in a system-wide load factor of 69.7 percent. In 1998 the system load factor increases to 70.0 percent based upon increases in capacity of 4.3 percent and RPMs of 4.8 percent. In 1999 and 2000 capacity in the industry is forecast to expand at relatively faster rates than RPMs, reducing the load factor in 1998 to 69.6 percent and in 2000 to 69.3 percent. For the remainder of the forecast period it is expected that capacity will grow at about the same rate as RPMs, producing an average load factor of 69.2 percent.

There are two ways to provide additional capacity for the domestic market beyond what is "planned" today. First, aircraft and crew utilization has some slack in it. Second, there are a number of "parked" aircraft, and some carriers may return some of this capacity to the market. The forecast assumes that available seat miles will increase in response to increased demand.

Domestic Passenger Load Factor

U.S. scheduled domestic air carriers had a load factor of 67.5 percent in 1996, up 2.3 points from 1995. Domestic load factors have varied very little over the period 1985 through 1993, ranging from a low of 60.3 percent in 1986 to 61.3 percent in 1993. In 1994 the load factor increased to 64.2 percent and in 1995 to 65.2 percent.

Capacity increased only 3.1 percent in 1996, and is expected to increase next year by 3.4 percent. The load factor should increase to 68.5 percent in 1997, and peak at 69.0 percent in 1998, as capacity expands at a slower rate than traffic. Beyond 1998 we expect that present fleet plans will provide capacity levels that should reduce the load factor to 68.0 percent by 2000, and keep it at that level for the remainder of the forecast period.

International Passenger Load Factor

The international load factor edged up to 72.9 percent in 1996, up from 71.4 percent in 1995--the highest annual load factor achieved in the past 28 years. The previous high of 69.2 percent was achieved in 1990.

The same forces that affect domestic capacity (fleet plans and break-even load factors) affect international capacity. As in domestic markets, US airlines are capable of adjusting their international capacity levels to changing levels of demand. The international load factor is forecast to remain relatively stable during the forecast period, declining slightly from 72.9 percent in 1996 to 72.4 percent in 2008.

The expectations for the individual market segments are as follows:

- In the Atlantic, the 1996 load factor was 76.3 percent, up 1.3 points over 1995. The forecast assumes an average load factor of 75.0 percent for the forecast period.

- In Latin America, load factor increased to 63.2 percent in 1996, up 0.2 points from 1995. The forecast assumes that the load factor will increase to 65.0 percent in 1999 and remain at this level for the remainder of the forecast period.

- In the Pacific, load factor increased to 74.5 percent in 1996, up 2.9 points from 1995. The load factor is forecast to level off at 74.0 percent for the period 1998 through 2008.

AIR CARRIER FORECASTS

The forecasts of air carrier demand are based on a specific set of assumptions concerning economic growth in the United States and abroad, the political environment in which they will take place, and changes in industry structure. Clearly, there are many uncertainties in all these areas that could significantly alter the short- and/or long-term environment, and cause the outcomes to be significantly different from those forecast. Some of the developments that could alter the forecasts include:

- the strength and duration of the current U.S. economic recovery;

- reinstatement of the federal passenger ticket tax and/or implementation of user fees to replace the current ticket tax;

- the impact of pecuniary and non-pecuniary costs of enhanced airline and airport security;

- the number of business cycles that occur over the forecast period;

- future oil price shocks;

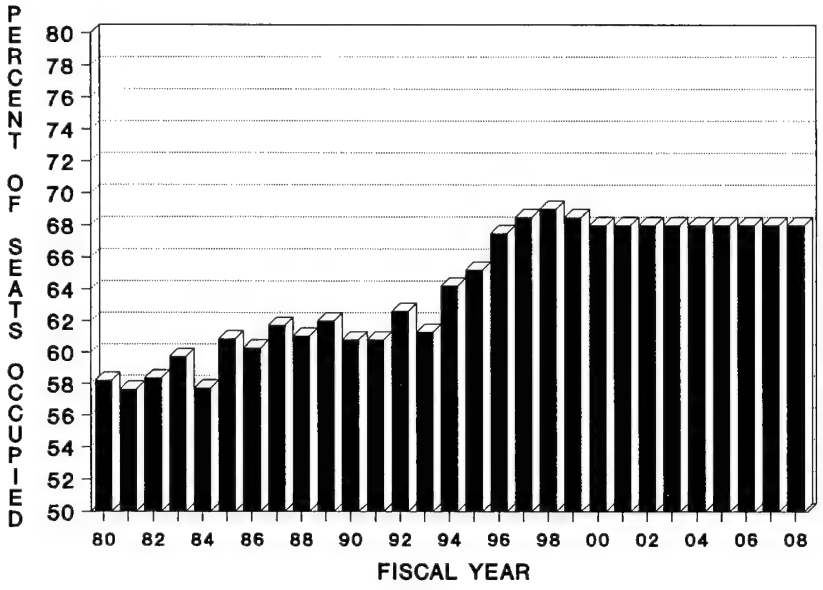
- the strength and duration of economic growth in Europe, Asia, and Latin America;

- structural changes in the international markets that affect U.S. carrier shares;

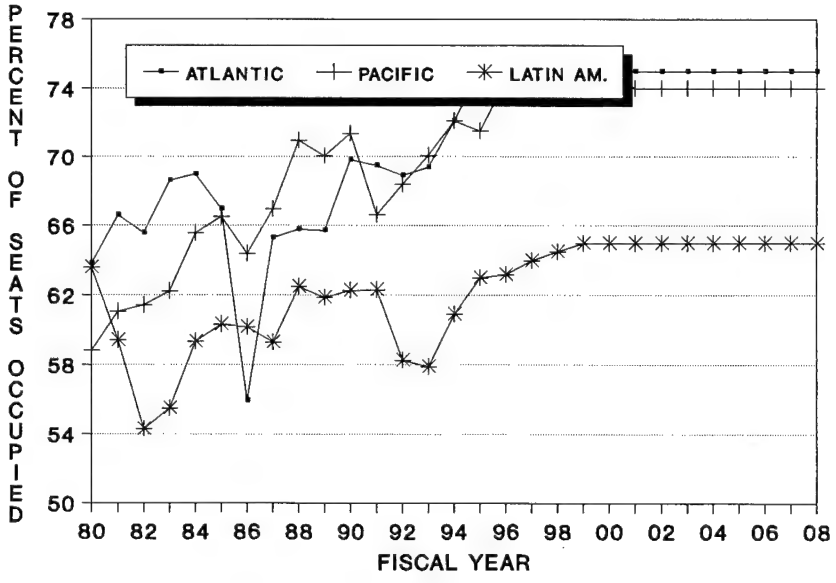
- how far carriers can reduce unit costs;

U.S COMMERCIAL AIR CARRIERS
PASSENGER LOAD FACTOR

DOMESTIC



INTERNATIONAL



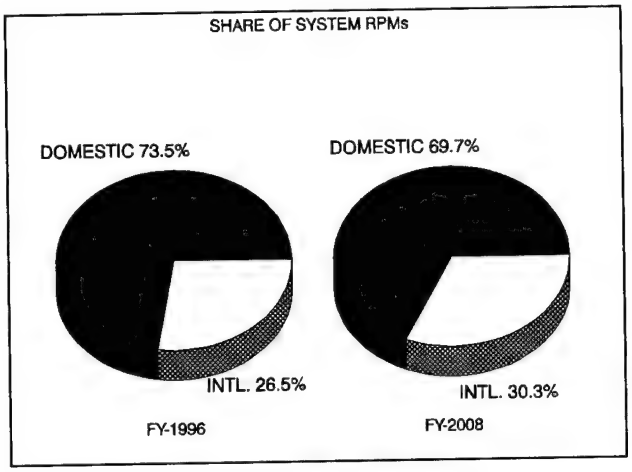
- how fast yields decline due to increased competition and cost reductions;
- when and if the industry reaches equilibrium; and
- how many carriers survive.

In addition, the network of bilateral pacts that the United States currently has in place in Europe, the Far East, and South America could significantly inhibit the expansion plans (current and future) of air carriers operating in these international regions and restrain traffic growth. On the other hand, the move towards deregulation, privatization of national carriers, and expansion of open-skies agreements could result in significantly greater traffic growth.

REVENUE PASSENGER MILES

U.S. scheduled air carriers recorded a total of 569.6 billion revenue passenger miles in 1996, up 6.1 percent. System passenger miles are forecast to increase 5.1 percent in 1997 and 4.8 percent in 1998, then taper off through the balance of the forecast period. Average annual growth in system RPMs is expected to be 4.6 percent, reaching 981 billion in 2008.

International growth is anticipated to be somewhat higher than domestic growth, with the average annual international growth in RPMs during the 12-year forecast period being 5.8 percent, compared to 4.2 percent for the domestic market. In the year 2008, the international share of the U.S. carriers' system RPMs is expected to be 30.3 percent, up from 26.5 percent in 1996, and 21.1 percent in 1980.



Domestic Revenue Passenger Miles

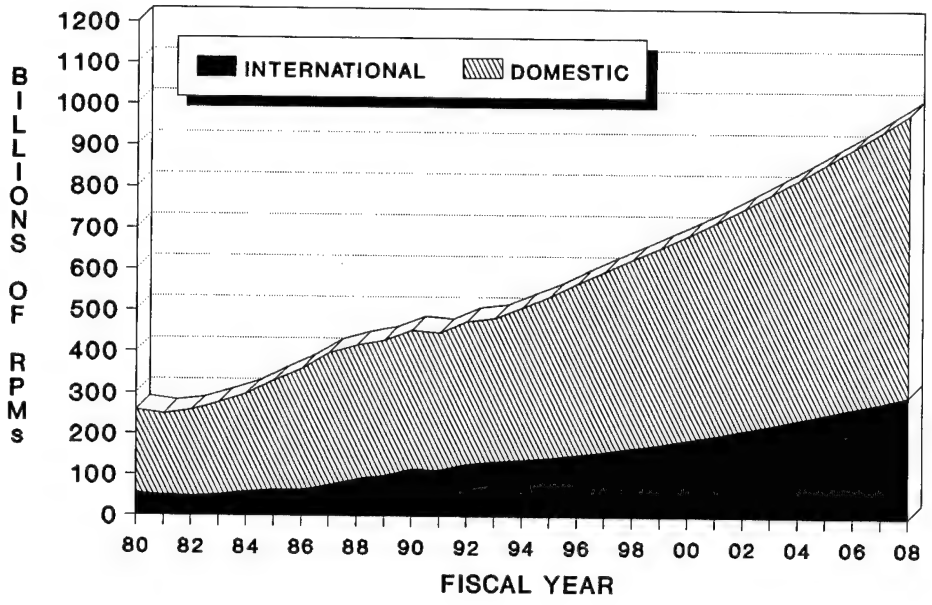
Scheduled domestic revenue passenger miles totaled 418.6 billion in 1996, up 6.6 percent from 1995. The relatively strong traffic growth in 1996 was largely influenced by growth of the U.S. economy, continued growth of the new entrant low-cost carriers, and declining fares. Domestic traffic is projected to increase 5.0 percent in 1997 with RPMs totaling 439.5 billion.

In 1998 RPMs are forecast to increase 4.5 percent. Traffic is then expected to taper gradually over the balance of the period. The average annual increase in domestic RPMs is estimated at 4.2 percent, reaching 683.7 billion in 2008.

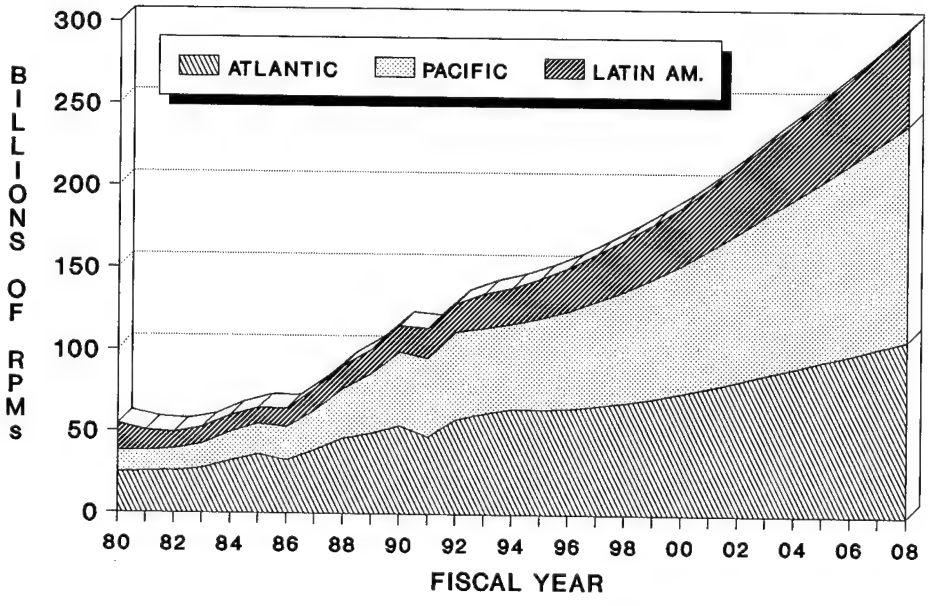
International Revenue Passenger Miles

International RPMs grew 4.7 percent in 1996. The growth was uneven, however, with increases of 8.9 percent in Latin American markets, 7.6 percent in Pacific markets, and only 0.5 percent in Atlantic markets.

U.S. COMMERCIAL AIR CARRIERS
SCHEDULED REVENUE PASSENGER MILES

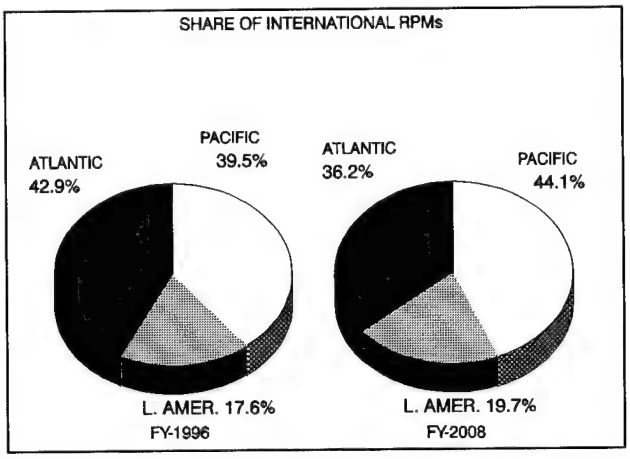


SCHEDULED INTERNATIONAL RPMS
BY TRAVEL REGION



Total RPMs in international markets are expected to approximately double during the forecast period, increasing from 151.1 billion in 1996 to 297.6 billion in 2008. The average annual growth rate over this period is 5.8 percent. This is 1.6 percentage points higher than the domestic growth rate and continues a trend that will see a greater percentage of system RPMs in the international market.

International RPMs are forecast to increase to 159.4 billion in 1997, up 5.5 percent, and to 168.3 billion in 1998, up 5.6 percent.



The relative importance of international market areas is expected to change during the forecast period, with Atlantic RPMs decreasing from 42.9 percent of the total in 1996 to 36.2 percent in 2008. The Pacific RPMs share increases from 39.5 percent in 1996 to 44.1 percent in 2008. Latin American RPMs increase from 17.6 percent in 1996 to 19.7 percent in 2008. These changes result from the differing market growth rates anticipated during the forecast period.

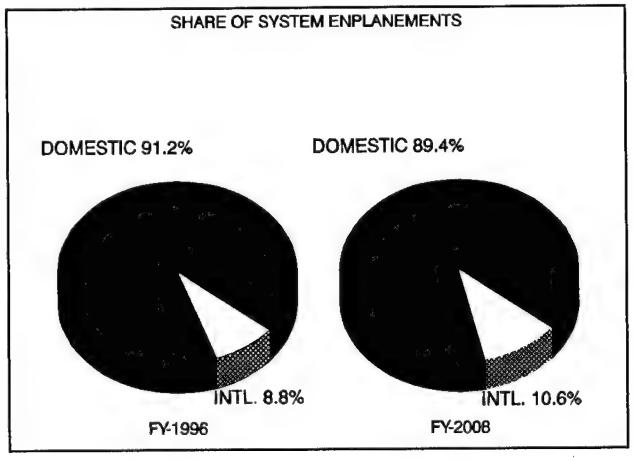
The projected RPMs for the Atlantic, Pacific, and Latin American markets are:

- Atlantic RPMs increase from 64.7 billion in 1996 to 107.7 billion in 2008, up 4.3 percent a year.
- Latin American RPMs increase from 26.6 billion in 1996 to 58.7 billion in 2008, up 6.8 percent a year.
- Pacific RPMs increase from 59.7 billion in 1996 to 131.2 billion in 2008, up 6.8 percent a year.

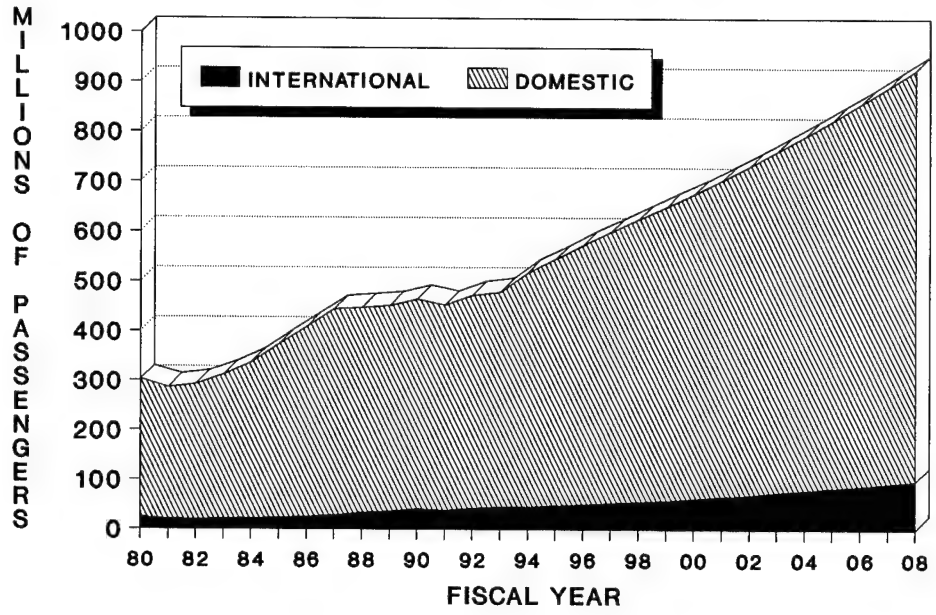
PASSENGER ENPLANEMENTS

In 1996, U.S. scheduled air carriers enplaned a total of 573.9 million passengers, up 5.3 percent. The continued growth of the U.S. economy along with domestic short-haul activity, is expected to result in strong traffic growth in 1997 and 1998. The market is expected to stabilize after 1998 with slower growth expected throughout the forecast period. System passenger enplanements are forecast to increase to 599.3 million in 1997, up 4.4 percent, and to 625.5 million in 1998. Thereafter, the growth rate will taper off. Overall average annual growth of enplanements for the 12-year forecast period is expected to be 4.1 percent.

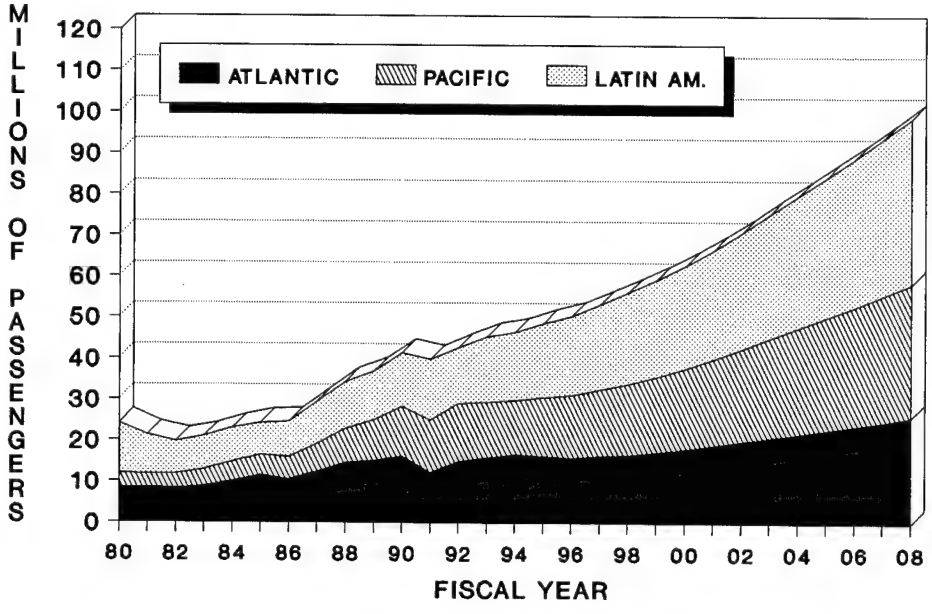
Enplanements grow at a slightly lower rate than RPMs because of the gradual increase in average trip length. In 1996, 91.2 percent of enplanements were domestic. This will drop to 89.4 percent in 2008.



U.S. COMMERCIAL AIR CARRIERS
SCHEDULED PASSENGER ENPLANEMENTS



SCHEDULED INTERNATIONAL ENPLANEMENTS
BY TRAVEL REGIONS



Domestic Passenger Enplanements

U.S. scheduled domestic air carriers enplaned a total of 523.6 million passengers in 1996, up 5.5 percent. Domestic passenger enplanements are forecast to increase to 546.2 million in 1997, up 4.3 percent.

Over the forecast period, domestic passenger enplanements are expected to increase at a somewhat slower rate than RPMs.

The growth in domestic enplanements is expected to average 3.9 percent annually during the 12-year forecast period, with the number of domestic enplanements reaching 827.1 million in 2008.

Total International Passengers (U.S. and Foreign Flag Carriers)

Based on Immigration and Naturalization Service (INS) data, which is compiled by the Department of Commerce, total international passengers grew 6.8 percent in CY 1995 (the latest year for which data is available), with increases of 10.6 percent in the Pacific market, 6.7 percent in the Atlantic market, and 4.6 percent in the Latin American market.

Total passengers in international markets are expected to approximately double during the forecast period, increasing from 94.8 million in CY 1996 to 183.7 million in CY 2008--an average annual growth rate of 5.7 percent. The U.S. share of the international traffic is also predicted to increase during the period, expanding from about 51.5 percent to 52 .0 percent in 2008. Total projected passenger growth rates for the Atlantic, Pacific, and Latin American markets are:

- Atlantic passengers increase from 38.5 million in CY 1996 to 66.7 million in CY 2008, up 4.7 percent annually.
- Latin American passengers increase from 33.9 million in CY 1996 to 70.1 million in CY 2008, up 6.2 percent annually.
- Pacific passengers increase from 22.4 million in CY 1996 to 46.8 million in CY 2008, up 6.3 percent annually.

U.S. Flag Carriers' International Passenger Enplanements

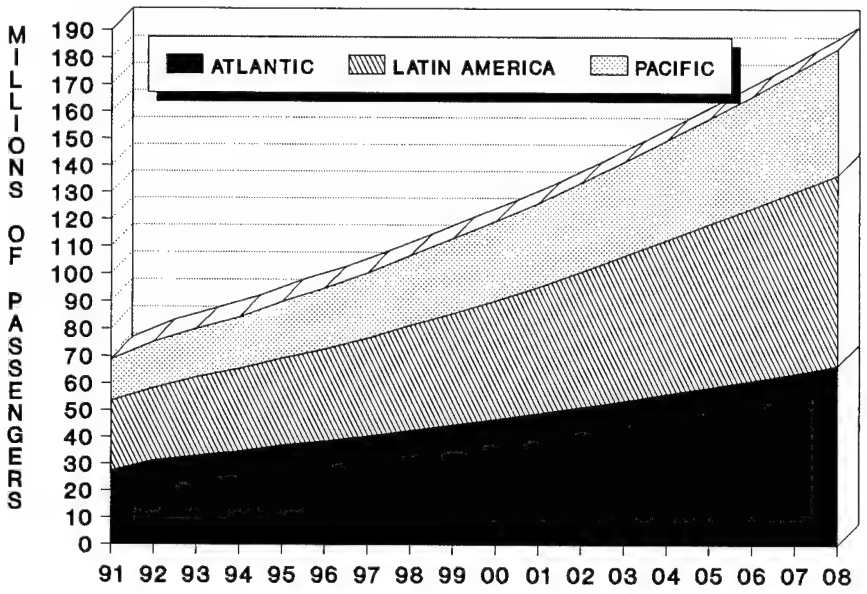
A total of 50.3 million passengers were enplaned by U.S. scheduled international airlines in 1996, up 3.6 percent. International enplanements are forecast to increase to 53.1 million in 1997, up 5.6 percent.

Enplanements will grow at about the same rate as RPMs. The average annual rate of growth during the forecast period will be 5.8 percent. Projected enplanements for the individual international markets are:

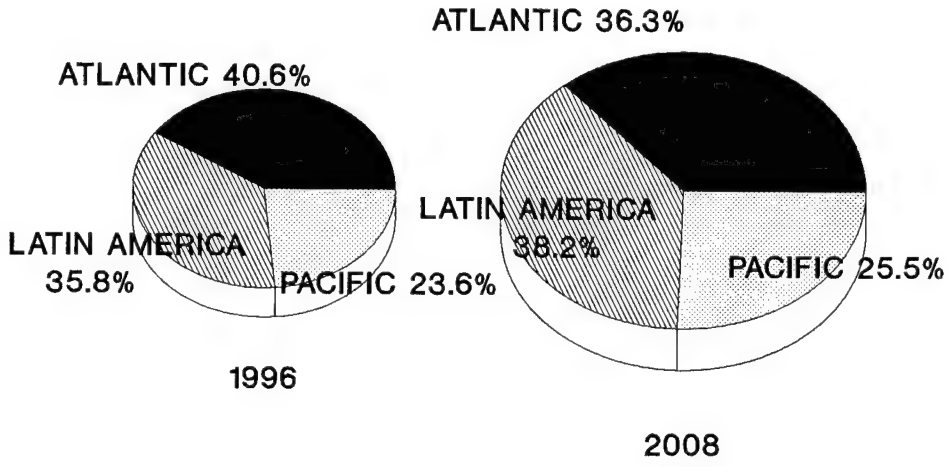
- Atlantic enplanements increase from 15.8 million in 1996 to 25.7 million in 2008, up 4.1 percent annually.
- Latin American enplanements increase from 19.2 million in 1996 to 40.2 million in 2008, up 6.3 percent annually.
- Pacific enplanements increase from 15.3 million in 1996 to 32.6 million in 2008, up 6.5 percent annually.

U.S. AND FOREIGN FLAG CARRIERS

TOTAL PASSENGER TRAFFIC TO/FROM U.S.

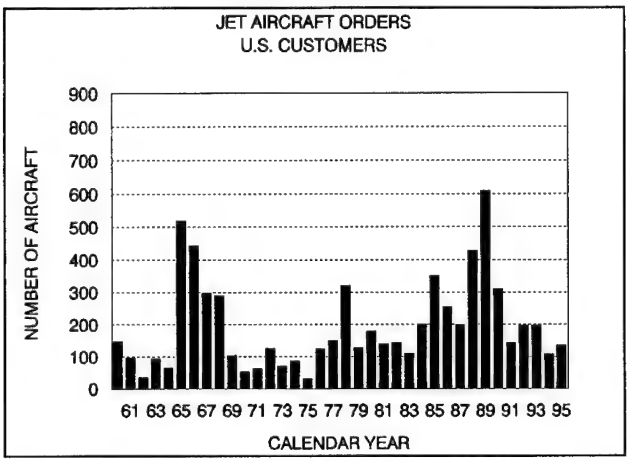


PERCENT BY WORLD REGION

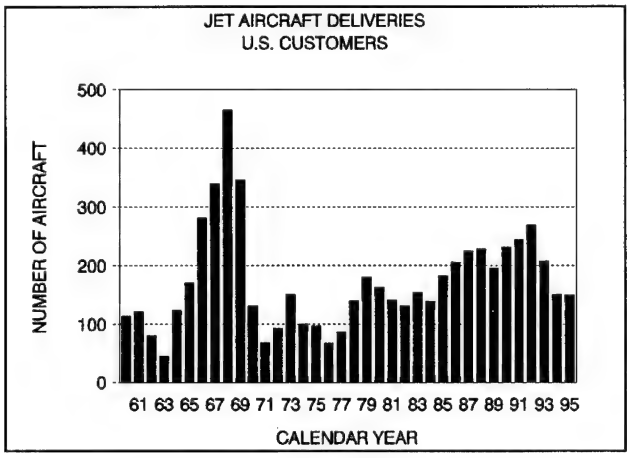


AIR CARRIER FLEET

World air carriers placed orders for an estimated 714 large jet aircraft with U.S. and foreign aircraft manufacturers during CY 1995, 105.7 percent more orders than in 1994. Of this total, 408 (57.1 percent) were for two engine (B-737, B-757, MD-80/90/95, A-320/321 and F-70/100) aircraft.



Aircraft manufacturers delivered approximately 483 large jet aircraft worldwide in 1995. Of this total, 261 (54.0 percent) were two-engine narrowbody aircraft, and 98 (20.2 percent) were for two-engine widebody aircraft.



Looking at the year ending December 1995, the fleet for U.S. air carriers expanded by an estimated 192 aircraft, an increase of 4.2 percent. This compares to 1994, when the fleet increased by 156 aircraft. Fleet changes in 1995 were similar to changes that occurred in 1994, namely a steep increase in stage-3 aircraft (up 288 aircraft or 10.6 percent) and a decline in stage-2 aircraft (down 119 aircraft or 6.8 percent).

This forecast assumes a 25-year life cycle for aircraft, but also follows guidelines of the national noise legislation. In particular, stage-2 aircraft will be withdrawn from the U.S. fleet by the end of 1999. At the end of 1995, there were approximately 1,636 stage-2 aircraft (34.3 percent of the total fleet) remaining in the U.S. air carrier jet fleet. The forecast reflects a decreasing number of stage-2 aircraft in the fleet in each year, declining to zero in 2000.

Based on the backlog of aircraft orders and the projections of air carrier traffic, seat capacity, load factors, and fleet requirements, the U.S. commercial air carrier fleet is projected to increase from an inventory of 4,774 aircraft on January 1, 1996, to 7,226 aircraft by January 1, 2008. This involves a net addition to the fleet (after retirements of obsolete aircraft) of approximately 204 aircraft annually (3.5 percent annually).

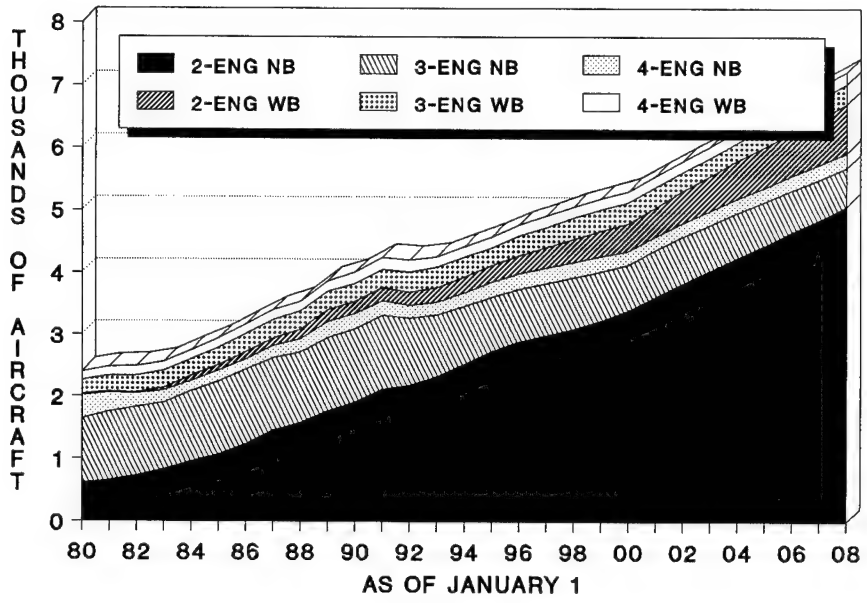
By far the largest increase, in terms of number of aircraft, is projected to occur in the two-engine narrowbody aircraft category, which is expected to grow by an average of 182 aircraft (4.8 percent) annually. By January 1, 2008, two-engine narrowbody aircraft are expected to total 5,075 units and to account for 70.2 percent of the fleet, up from 60.5 percent in 1996.

The number of three-engine narrowbody (B-727) aircraft is expected to decline from 854 aircraft (17.9 percent of fleet) in 1996 to 615 (8.5 percent of fleet) in the year 2008. All of these must be modified by the year 2000 to satisfy noise regulations. The number of four-engine narrowbody aircraft will also decline, from 247 aircraft in 1996 to 241 aircraft in 2008.

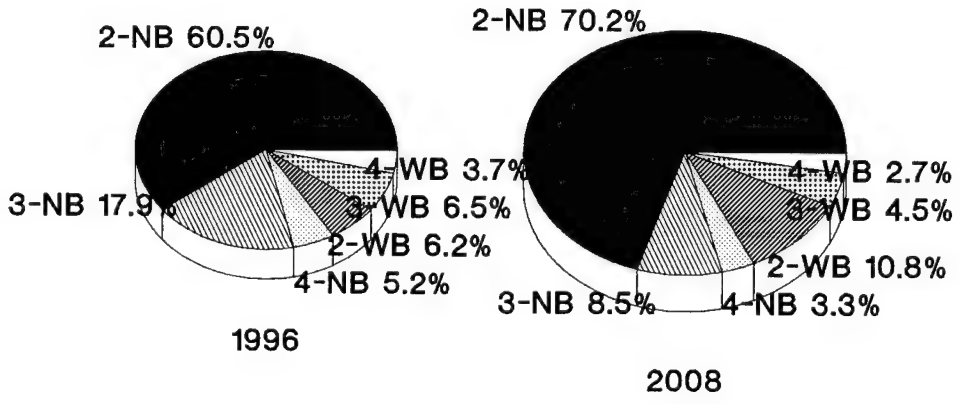
Widebody aircraft, which accounted for 16.4 percent of the fleet in 1996, are expected to

U.S. COMMERCIAL AIR CARRIERS

LARGE JET AIRCRAFT

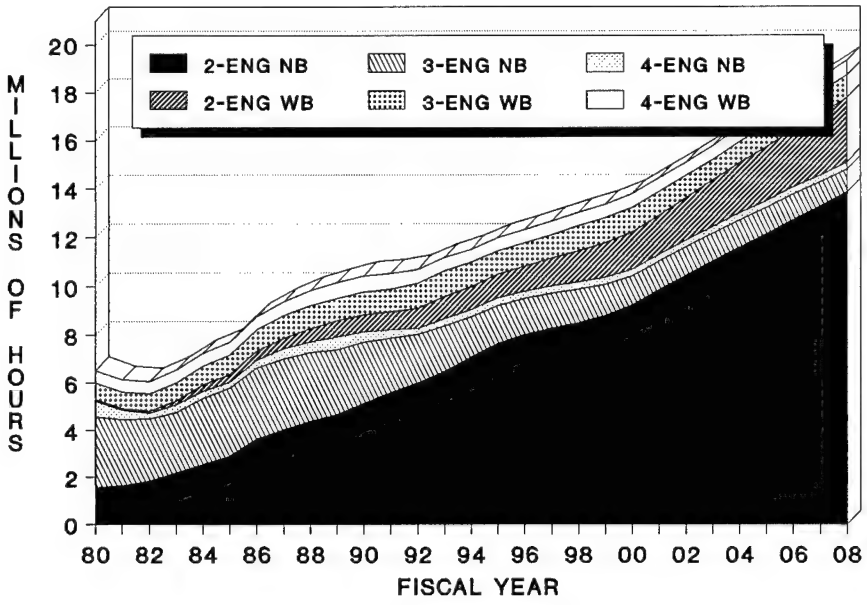


PERCENT BY AIRCRAFT TYPE

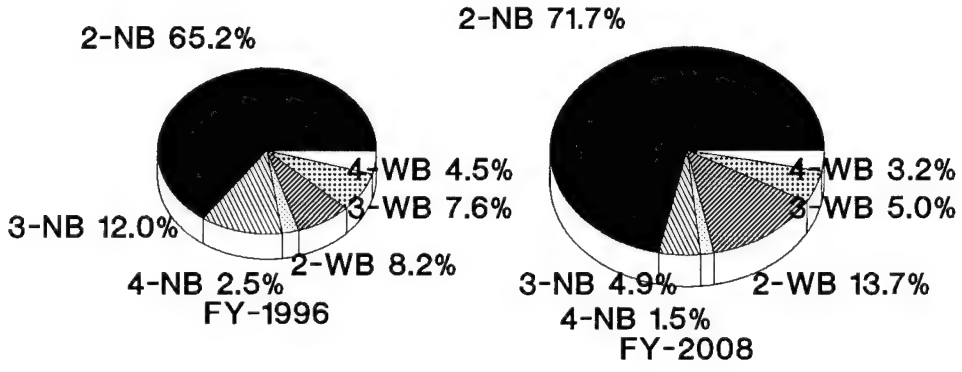


U.S. COMMERCIAL AIR CARRIERS

AIRBORNE HOURS



PERCENT DISTRIBUTION BY AIRCRAFT TYPE



account for 18.0 percent in 2008. The fleet of two-engine widebody aircraft (A-300/310/ 319/330, B-767, and B-777) is the fastest growing of the widebody group. These are expected to increase by an average of 40 aircraft per year (8.4 percent), from 296 aircraft in 1996 to 778 aircraft in 2008.

Four-engine widebody (B-747 and A-340) aircraft are forecast to increase from 177 aircraft in 1996 to 196 aircraft in 2008, an annual increase that averages about 0.9 percent. The three-engine widebody fleet (MD-11, DC-10, and L-1011) is projected to expand over the forecast period, from 312 aircraft in 1996 to 321 in 2008, an average annual increase of only 0.2 percent.

AIRBORNE HOURS

U.S. commercial air carriers flew an estimated total of 12.3 million hours in 1996, up from 12.0 million hours in 1995. Two aircraft categories accounted for over three-fourths of total airborne hours: two-engine narrowbody aircraft (65.2 percent) and three-engine narrowbody (12.0 percent). In 2008, the number of hours is forecast to increase to 19.3 million, an average annual increase of 3.8 percent. Airborne hours are forecast to increase 2.8 percent in 1997 to 12.7 million, and 2.7 percent in 1998, to 13.0 million.

Two-engine aircraft (both narrowbody and widebody) are projected to account for 85.4 percent of all airborne hours flown in 2008. Narrowbody two-engine aircraft make up 71.7 per-cent of total hours in 2008, up an average of 4.6 percent per year. Widebody two-engine aircraft make up 13.7 percent of the hours in 2008, up an average of 8.4 percent per year.

The number of hours flown by three-engine and four-engine widebody aircraft are forecast to show relatively small increases during the forecast period. Three-engine widebody hours flown are expected to increase 0.2 percent a year, while four-engine widebody aircraft hours flown are forecast to increase 0.8 percent a year. The share of total hours flown for three-engine widebody aircraft will decrease from 7.6 percent in 1996 to 5.0 percent in 2008, and the share for four-engine widebody aircraft will decline from 4.5 percent to 3.2 percent.

The number of hours flown by three-engine narrowbody aircraft will decline significantly over the forecast period. Hours for this aircraft type drop from 1.5 million in 1996 to 0.9 million in 2008, or 35.7 percent. This reflects the retirement of large numbers of B-727 aircraft. Hours for the four-engine narrowbody fleet, made up primarily of DC-8s, are expected to decline 0.4 percent a year.

CHAPTER IV
REGIONALS/COMMUTERS

CHAPTER IV

REGIONALS/COMMUTERS

The regional/commuter airline industry, for the purpose of this forecast, is defined as those air carriers that provide regularly scheduled passenger service and whose fleets are composed predominantly of aircraft having 60 seats or less. During 1996, 108 regional/ commuter airlines reported traffic data to the Bureau of Transportation Statistics (BTS), Office of Airline Information, on Form 298-C and/or Form 41.

The FAA historical data base includes activity for all regionals/commuters operating in the 48 contiguous States, Hawaii, Puerto Rico, and the U.S. Virgin Islands. Excluded from the data base is activity in Alaska, other U.S. territories, and foreign territories. Alaskan activity is excluded from the forecast because of its unique operating environment and service characteristics compared to the rest of the United States.

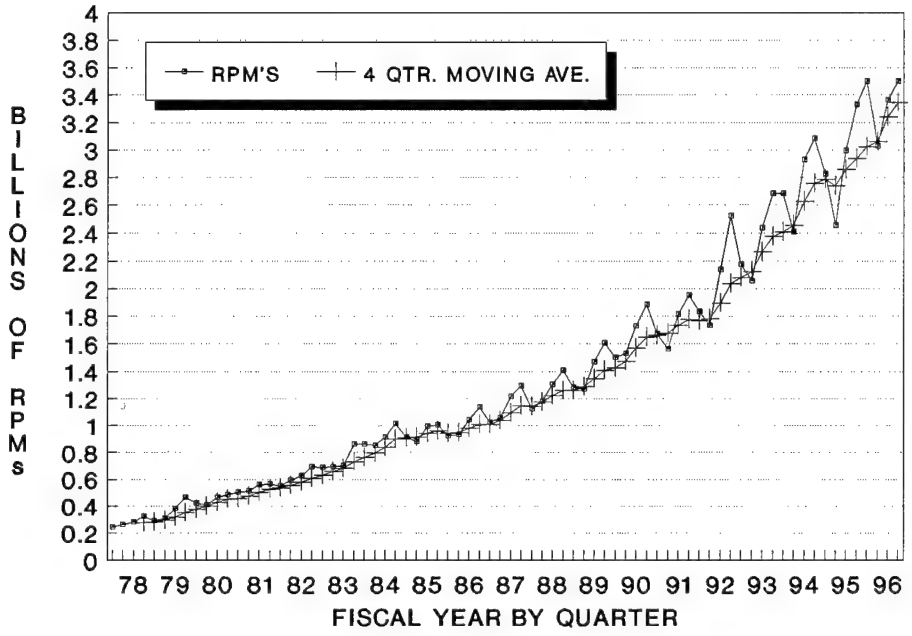
Additionally, the regional/commuter traffic statistics include duplicated enplanement and revenue passenger miles (RPMs) data for selected operators also included in the commercial air carrier traffic statistics. This duplication results from air carriers operating both large turboprop and turbojets (over 60 seats) as well as commuter-type aircraft. The level of duplicated traffic (enplanements and RPMs) is presented in the technical notes at the beginning of Chapter IX for Tables 11 and 20. In 1996, a total of nine carriers reported for all or a part of the year on BTS Form 41. In the following industry discussion, references to or distinctions between the two groups of carriers will be made in terms of Form 41 carriers and Form 298-C carriers.

REVIEW OF 1996

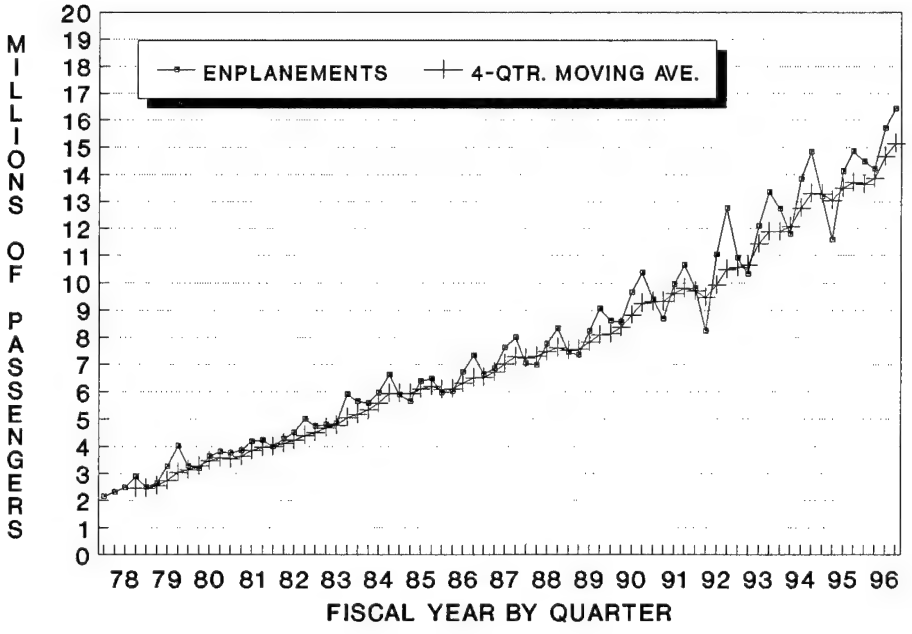
The regional/commuter airline industry has been in a period of transition since 1984. First, there was dramatic growth in the number of code-sharing agreements with the major air carriers in 1984, followed in 1986 by a wave of air carrier acquisitions of, or purchases of equity interest in, their regional/commuter code-sharing partners. The evolution of the relationships with the larger air carriers has led to further route rationalization policies on the part of the larger partner, which has resulted in the transferring of increasing numbers of short-haul jet routes to their regional partners. It is this transferring of routes which has sustained the regional industry's historic high rate of growth over the past decade. Together, these actions have resulted in a process of industry consolidation, concentration, and increasing integration with

U.S. REGIONALS/COMMUTERS TRAFFIC TRENDS

REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS



the large commercial air carriers that has continued through 1996.

INDUSTRY SUMMARY

The number of regional/commuter airlines totaled 108 in 1996, down from 124 carriers in 1995. While the number of reporting airlines declined, growth rebounded sharply after a year of no growth in 1995, comparing more favorably to the industry's historical long-term trend. Traffic growth in 1995 was impacted by several factors, including the temporary grounding of the ATR aircraft and changes in hubbing operations by several major carriers.

REVENUE PASSENGER ENPLANEMENTS

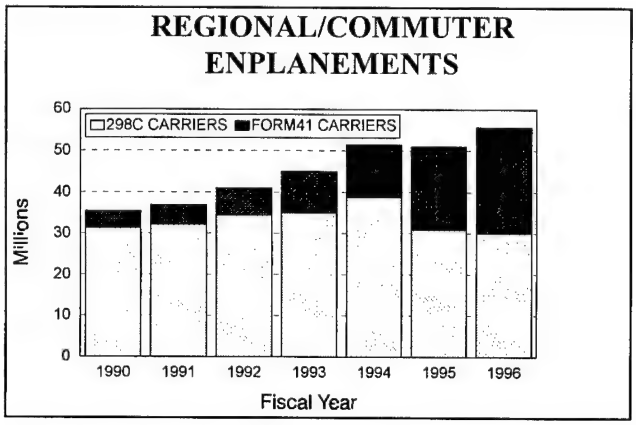
Total revenue passenger enplanements for the regional/commuter airlines, including Alaska and foreign territories, totaled 60.5 million in 1996, an increase of 7.8 percent compared to 1995. Excluding Alaska and foreign territories, enplanements totaled 57.5 million, up 8.1 percent over 1995.

48 Contiguous States

For the 48 contiguous States, enplanements increased 8.0 percent in 1996, reaching 55.2 million. Carriers operating only commuter aircraft of 60 seats or less (reporting on BTS Form 298-C) enplaned 31.3 million passengers in 1996, a decrease of 1.9 percent from 1995.

The nine carriers operating both large as well as smaller commuter aircraft (reporting on BTS Form 41) enplaned 23.9 million passengers, an increase of 18.3 percent over 1995.

In 1996, the nine carriers reporting on Form 41 accounted for 43.3 percent of all passengers enplaned in the 48 contiguous States, up from only 11.5 percent in 1990. Over this 6-year period, the enplanements of carriers operating the larger aircraft have increased from 4.1 million in 1990 to the current 23.9 million, an average annual increase of 34.2 percent. On the other hand, those carriers operating only the smaller commuter aircraft have seen their enplanements remain almost unchanged from the 31.4 million recorde in 1990.



Hawaii/Puerto Rico/Virgin Islands

Enplanements in Hawaii, Puerto Rico, and the Virgin Islands totaled 2.3 million, an increase of 9.5 percent over 1995. Enplanements in Hawaii increased 25.0 percent in 1996. This large increase reflects the first full year of operations of a new carrier--Mahalo Air. The number of enplanements in Puerto Rico and the Virgin Islands increased 3.7 percent compared to 1995.

Alaska

While not included in the forecast base, enplanements in Alaska and other U.S. and foreign territories totaled 2.9 million in 1996, almost unchanged compared to 1995. Enplanements in Alaska decreased by just under 10 percent in 1996, due primarily to the cessation of operations by MarkAir Express in January 1996. Enplanements in the other territories were up 10.9 percent.

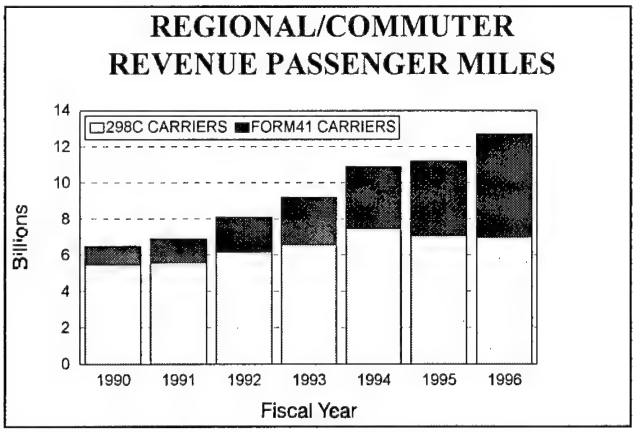
REVENUE PASSENGER MILES

Regional/commuter passenger miles totaled just under 13.4 billion in 1996, an increase of 12.6 percent over 1995. Excluding Alaska and foreign territories, industry RPMs totaled just under 12.9 billion, an increase of 11.3 percent.

48 Contiguous States

For the 48 contiguous States, revenue passenger miles increased 12.0 percent in 1996, totaling over 12.6 billion. Carriers reporting on BTS Form 298C reported RPMs totaling 7.1 billion in 1996, an increase of 6.0 percent from 1995. The nine carriers reporting on BTS Form 41 reported 5.5 billion RPMs in 1996, an increase of 22.2 percent.

In 1996, the nine carriers reporting on Form 41 accounted for 43.7 percent of all RPMs in the 48 contiguous States, up from only 13.8 percent in 1990. Over this 6-year period, the RPMs of carriers operating the larger aircraft have increased from 0.9 billion in 1990 to 5.5 billion, an average annual increase of 35.2 percent. The RPMs of carriers operating only the smaller commuter aircraft have increased by 4.0 percent annually during the same 6-year period--from 5.6 to 7.1 billion.



Hawaii/Puerto Rico/Virgin Islands

Passenger miles in Hawaii, Puerto Rico, and the Virgin Islands (246.5 million) increased by 18.9 percent in 1996. Passenger miles in Hawaii increased 32.9 percent, from 70.8 million to 94.1 million. Again, this reflects the first full year of operation of Mahalo Air. For Puerto Rico and the U.S. Virgin Islands, passenger miles increased 11.6 percent, from 136.5 million to 152.4 million.

Alaska

Passenger miles in Alaska and other territories totaled 515.0 million in 1996, an increase of 6.8 percent. Passenger miles in Alaska declined by just over 14.4 percent in 1996. Again, as with passenger enplanements, this decline is attributable primarily to the cessation of operations of MarkAir Express during the first quarter of FY 1996.

INDUSTRY COMPOSITION

The fundamental character of the regional/commuter industry has changed considerably since the mid-1980s. These changes include the relative size and sophistication of airline operations, the carriers involved (especially the dominant industry operators), the aircraft fleet mix, and the industry's relationship with the large commercial air carriers in the national air transportation system. The role of the regional/commuter industry has not changed since its inception, that is, to provide feeder service to the large hubs served by the large commercial air carriers. However, the exact scope and relationships of its role have changed dramatically.

The composition of the regional/commuter airline industry continued to evolve during 1996. The factors contributing to this change include economic and competitive influences, marketing strategies, and alliances with the larger commercial air carriers. Two distinct but interrelated trends have provided the basis for the changing character and composition of the industry since the mid-1980s. They are industry consolidation and the increasing integration of regional/commuter operations with the larger air carriers.

INDUSTRY CONSOLIDATION

The number of regional/commuter airlines has declined by more than half since 1981, from 250 to only 108 carriers in 1996. The 108 operators in 1996 represents a drop of 16 carriers compared to 1995 when 124 carriers reported traffic data to BTS. However, the decline is even more dramatic, since there were only 103 carriers still in operation at the end of the fiscal year. Because of the increased integration of operations with the larger commercial air carriers (through code-sharing agreements and acquisition of regionals, totally or in part), the success of many regionals is tied closely to the success of their larger partners. At the present time, there is no reason to assume that the trend toward further consolidation of the regional/commuter industry will not continue for at least several more years.

INDUSTRY CONCENTRATION

While the number of carriers has declined, the size of the dominant industry carriers has increased dramatically. This has resulted in increased industry concentration, with the top 50 carriers accounting for 98.6 percent of the total industry enplanements in 1996, up form 97.0 percent in 1995. While total industry enplanements (including Alaska) increased by 7.8 percent in 1996, the top 50 carriers grew at a rate of almost two percentage points higher (9.6 percent).

The top 50 carriers in 1996 are listed in the table on page IV-6. Although the relative ranking has changed for many carriers, the composition of the group is basically unchanged from 1995.

The top 50 carrier data is based on BTS Form 298-C and Form 41 reporting entities. However, this carrier listing does not fully reflect the level of industry consolidation, concentration, and integration with the large air carriers. Some of the regionals are owned, totally or in part, by their larger code-sharing partners and still others are owned by other regionals. A total of 15 regionals are owned, totally or in part, by seven of the larger commercial air carriers, and five more are owned by three other regionals.

TABLE IV-1

TOP 50

REGIONAL/COMMUTER AIRLINES

RANKED BY TOTAL PASSENGER ENPLANEMENTS

FISCAL YEAR 1996

1. Simmons Airlines	26. Gulfstream International
2 . Comair	27. ERA Aviation
3. Mesa	28. Aloha IslandAir
4. Continental Express	29. Air Midwest
5. Horizon	30. Astral Aviation
6. Atlantic Southeast	31. Cape Air
7. Flagship Airlines	32. Paradise Island
8. Piedmont Airlines	33. Scenic Airlines
9. SkyWest Airlines	34. GP Express
10. Trans States	35. Peninsula Airways
11. Wings West	36. Air Vegas
12. Piedmont Airlines	37. Pacific Island Aviation
13. Mesaba	38. Eagle Canyon Airlines
14. Express Airline I	39. Conquest Airlines
15. WestAir	40. Lone Star Airlines
16. Executive Airlines	41. Viequies Air Link
17. Business Express	42. Chicago Express Airlines
18. Atlantic Coast	43. Colgan Air
19. Great Lakes	44. Yute Air Alaska
20. PSA Airlines	45. Air Nevada
21. CCAir	46. Samoa Air
22. Commutair	47. Freedom Air
23. United Feeder Service	48. LAB Flying Service
24. Chautauqua	49. Taquan Air Srvice
25. Mahalo Air	50. Bering Air

Source: BTS Form 298-C and Form 41 enplanement data

TABLE IV-2

TOP 30 CORPORATE STRUCTURES

Carrier/ Carrier Group	Enplanements (Millions)	Carrier/ Carrier Group	Enplanements (Millions)
1. American Eagle	12.4	16. Mahalo	0.6
2. Delta Connection	11.0	17. Gulfstream International	0.5
3. Mesa	6.2	18. ERA Aviation	0.4
4. USAir Express	5.5	19. Aloha IslandAir	0.4
5. Continental Express	4.0	20. Midwest Express	0.3
6. Alaska	3.8	21. Cape Air	0.3
7. Trans States	2.7	22. Paradise Island	0.3
8. Northwest Airlink	1.8	23. GP Express	0.2
9. Express Airline I	1.7	24. Peninsula Airways	0.2
10. Business Express	1.5	25. Air Vegas	0.2
11. Atlantic Coast	1.4	26. Pacific Island Aviation	0.1
12. Great Lakes	1.0	27. Eagle Canyon Airlines	0.1
13. CCAir	0.8	28. Conquest	0.1
14. Commutair	0.7	29. Lone Star Airlines	0.1
15. Chautauqua	0.6	30. Viequies Air Link	0.1

A truer picture of the current industry composition is presented in the table at the top of this page which portrays the industry from a corporate structure point of view. This table lists the top 30 regional/commuter corporate structures and percentage share of 1996 industry enplanements. Viewed in this manner, it can be seen that there is a much higher level of industry concentration and integration with the large commercial airlines. In 1996, enplanements for the top 30 carriers increased by 9.8 percent and they accounted for just under 97.6 percent of total industry enplanements.

FORECAST ASSUMPTIONS

Industry growth is expected to out-pace that of the larger commercial air carriers and to be driven by the increased demand for aviation services. The introduction of new state-of-the-art aircraft, especially large high-speed turboprops and regional jets with ranges of up to 1,000 miles, opens up new opportunities for growth in nontraditional markets. However, the

TABLE IV-3

AIR CARRIER/COMMUTER AIRLINES CODE-SHARING AGREEMENTS

Air Carrier Program Name	Designated Commuter Carrier	Hubs Served
1. Alaska Airlines	Horizon*	Boise Portland Seattle Spokane
2. Aloha Airlines	Aloha IslandAir	Honolulu
3. America West Express	Mesa Air Group*	Phoenix
4. American Eagle	Executive Airlines*	San Juan
	Flagship Airlines	Chicago Miami Nashville New York
	Simmons*	Dallas/Ft. Worth Chicago
	Wings West	Dallas/Ft. Worth Los Angeles
5. Continental Express	Continental Express*	Cleveland Houston Newark
	GP Express	Denver
	SkyWest Airlines	Los Angeles
6. Delta Connection	Atlantic Southeast*	Atlanta Dallas/Ft. Worth
	Business Express	Boston New York
	Comair	Cincinnati Florida
	SkyWest Airlines	Los Angeles Salt Lake City
7. Hawaiian Airlines	Mahalo Air	Honolulu
8. Midwest Express	Astral Aviation	Milwaukee

TABLE IV-3

AIR CARRIER/COMMUTER AIRLINES
CODE SHARING AGREEMENTS (Continued)

Air Carrier Program Name	Designated Commuter Carrier	Hubs Served
9. Northwest Airlink	Business Express	Boston
	Express Airlines I	Memphis
		Minneapolis/St. Paul
	Horizon*	Portland
		Seattle
	Mesaba	Detroit
		Minneapolis/St. Paul
	Trans States*	Los Angeles
		San Francisco
10. Trans World Express	Trans States*	St. Louis
11. United Express	Atlantic Coast	Washington, D C
	Great Lakes	Chicago
		Denver
	Gulfstream International	Miami
	Mesa Air Group*	Denver
		Los Angeles
		San Francisco
		Seattle
	WestAir	Los Angeles
		San Francisco
	United Feeder Service*	Chicago
11. USAir Express	Allegheny Airlines	Baltimore
		Boston
		New York
		Philadelphia
		Pittsburgh
		Washington, D.C.
	CCAir	Baltimore
		Charlotte
	Chautauqua	Indianapolis
		Pittsburgh
	Commutair	Boston
		New York
		Philadelphia

TABLE IV-3

AIR CARRIER/COMMUTER AIRLINES
CODE SHARING AGREEMENTS (Continued)

Air Carrier Program Name	Designated Commuter Carrier	Hubs Served
11. USAir Express (Continued)	Mesa Air Group*	Baltomore
		Boston
		Charlotte
		Florida
		New York
		Philadelphia
		Pittsburgh
		Washington, D.C.
	PSA Airlines	Baltimore
		Charlotte
		Philadelphia
		Pittsburgh
		Washington, D.C.
	Paradise Island	Tampa
	Piedmont Airlines	Baltimore
		Charlotte
		Florida
		Philadelphia
		Washington, D.C.
	Trans States*	Los Angeles
		San Francisco

*Carrier operates both large aircraft (over 60 seats) and commuter aircraft.

role of the regional airline industry will remain that of feeding traffic to the major and national carriers even as the regionals expand into markets with longer route segments.

The regional airline industry is expected to continue to benefit from the continuing integration of service with the large commercial air carriers and further route rationalization by its larger partners. The continued need of the large commercial air carriers to reduce overall costs and fleet size ensures that some routes will continue to be transferred to their regional partners. However, this will not be as significant a driver of growth for the regional industry as in the past.

While the hand-off of short haul routes is expected to continue, it will be at a much diminished rate compared to past years. Thus the future rate of growth in enplanements will be lower than that experienced in the past. Also contributing to the slower growth in passenger traffic is the fact that the large commercial carriers are operating at relatively high load factors, which tends to diminish the value of additional feed traffic. Until the major and national air carriers begin to add fleet capacity, they will not require significant increases in feed traffic from their regional partners.

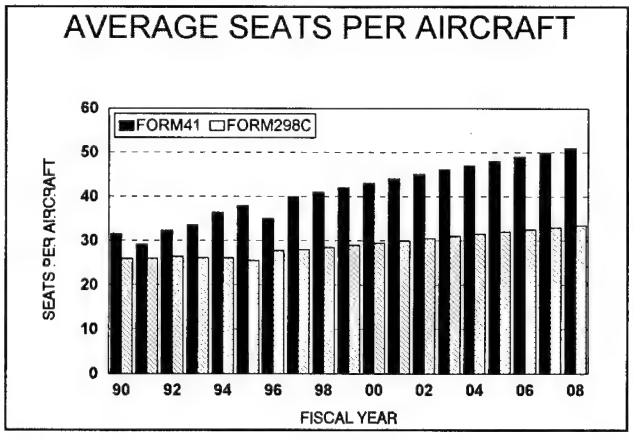
Revenue passenger miles are expected to increase at a faster rate than enplanements because the regional airlines are moving into larger aircraft having longer ranges. This will open up additional markets for the regional/ commuter operators. Thus the average passenger trip length is expected to increase during the forecast period, but the regional/ commuter carriers will continue to serve primarily shorter-haul markets. The emphasis will be on improved service quality and schedule frequency in the markets best suited to their operations.

The baseline assumptions for the average seats per aircraft, passenger trip length, and load factors are presented in Chapter IX, Table 19.

AVERAGE AIRCRAFT SIZE

The most significant change in the fleet composition will result from the introduction of regional jet aircraft, many of which fall in the "40 to 60 seat" category. These aircraft will contribute to increased public acceptance of regional airline service, and will offer greater potential for replacement service on selected jet routes.

It is also expected that the regional/commuter aircraft fleet will continue to grow during the forecast period. The average seats per aircraft is expected to increase 1.9 percent annually (just over 0.6 seats per year) during the 12-year forecast period, from 30.5 in 1996 to 38.0 in 2008.



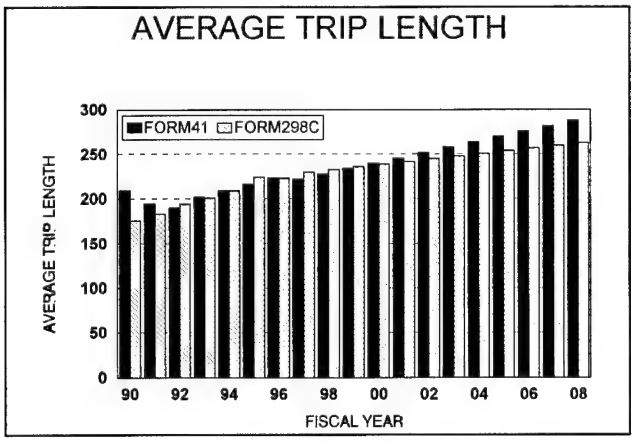
Most of the growth in seat size is expected to come from those carriers operating the larger turboprop and turbojet aircraft. The average aircraft size of carriers reporting on BTS Form 41 is projected to increase from 35.0 seats

in 1996 to 51.0 seats in 2008, or an increase of 1.3 seats annually. For those carriers operating *only* aircraft of 60 seats or less, the average aircraft size is expected to grow from 27.8 seats in 1996 to 33.5 seats in 2008, an increase of just under one-half seat annually.

PASSENGER TRIP LENGTH

The growth in the average passenger trip length and resulting growth in RPMs will be driven, in large part, by the increased introduction of larger high-speed turboprop and regional jet aircraft. With increased speed and capacity, these aircraft will contribute to an expanded market area that can be served on a timely and efficient basis by the regional/commuter airline industry.

The average passenger trip length in the 48 contiguous States is projected to increase from 228.4 miles in 1996 to 276.3 miles in 2008, an average annual growth rate of 1.6 percent. The average trip length for Hawaii, Puerto Rico, and the Virgin Islands is expected to increase from 105.4 miles in 1996 to 106.4 miles in 2008, an average annual growth of 0.1 percent for the forecast period.

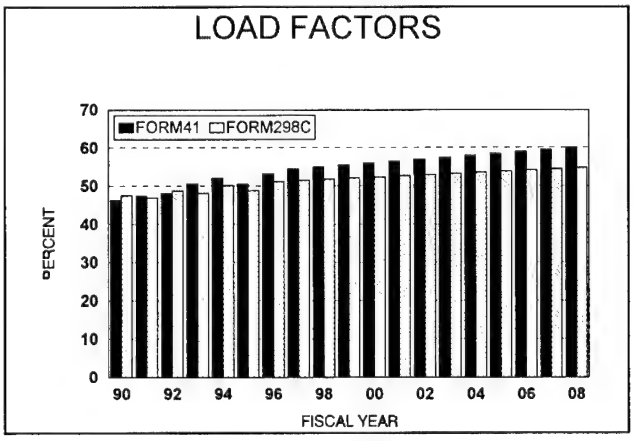


Again, most of the increase in the average trip length will be accounted for by the Form 41 carriers operating the larger turboprop and turbojet aircraft. The trip length of these carriers is forecast to increase from 223.6 miles in 1996 to 288.0 miles in 2008, up over 5 miles annually. For Form 298-C carriers, the trip length is expected to increase from 223.1 miles in 1996 to 263.0 miles in 2008, an increase of just over 3 miles annually.

PASSENGER LOAD FACTOR

Also, with the introduction of larger aircraft into the regional fleet, the industry load factor is expected to rise slowly as the average seat size of the fleet increases. The average industry load factor is expected to increase from 52.1 in 1996 to 56.4 in 2008. This also reflects, in part, the continuing emphasis on frequency of service.

The load factor of carriers reporting on BTS Form 41 increases from 53.3 percent in 1996 to 60.0 percent in 2008. The load factor of the Form 298-C carriers increases from 51.2 to 54.8 percent over the same time period.



REGIONAL/COMMUTER FORECASTS

It should be noted that the forecasts discussed in the following paragraphs do not contain any assumptions with regard to the potential impact of the rule requiring Part 135 regional/ commuter airlines to operate under Part 121 operating standards. At the current time, there is not enough factual information or analysis available to determine whether the rule will impact the industry activity levels positively, negatively, or at all. The FAA intends to track regional/ commuter traffic results very closely during the coming year to try to discern what impact, if any, the rule may have on the demand for regional/commuter services. If it is determined that the rule is having an impact on traffic, either positively or negatively, these findings will be factored into future years' forecasts.

REVENUE PASSENGER MILES

Regional/commuter revenue passenger miles are expected to increase to 14.2 billion (up 10.5 percent) in 1997 and to 15.2 billion (up 7.0 percent) in 1998. Passenger miles are forecast to increase at an average annual rate of 7.1 percent during the 12-year forecast period, totaling 29.0 billion in 2008.

Passenger miles in the 48 contiguous States are forecast to increase 10.6 percent (to 13.9 billion) in 1997 and 7.9 percent in 1998 (to 15.0 billion). During the 12-year forecast period, passenger miles are expected to increase at an average annual rate of 7.1 percent, totaling 28.7 billion in 2008.

Passenger miles in Hawaii, Puerto Rico, and the Virgin Islands are projected to increase to 257.3 million (up 4.4 percent) in 1997 and to 261.6 million (up 1.7 percent) in 1998. During the 12-year forecast period, passenger miles are expected to grow at an average annual rate of 1.9 percent, totaling 307.8 million in 2008.

REVENUE PASSENGER ENPLANEMENTS

Regional/commuter passenger enplanements are projected to increase to 62.5 million (up 8.7 percent) in 1997 and to 65.9 million (up 5.4 percent) in 1998. Passenger enplanements are expected to increase at an average annual rate of 5.3 percent during the 12-year forecast period, and reach a total of 106.9 million in 2008.

The number of passengers enplaned within the 48 contiguous States is projected to increase to 60.1 million (up 8.9 percent) in 1997 and to 63.4 million (up 5.5 percent) in 1998. Over the 12-year forecast period, enplanements are forecast to increase at an average annual rate of 5.4 percent, totaling 104.0 million in 2008.

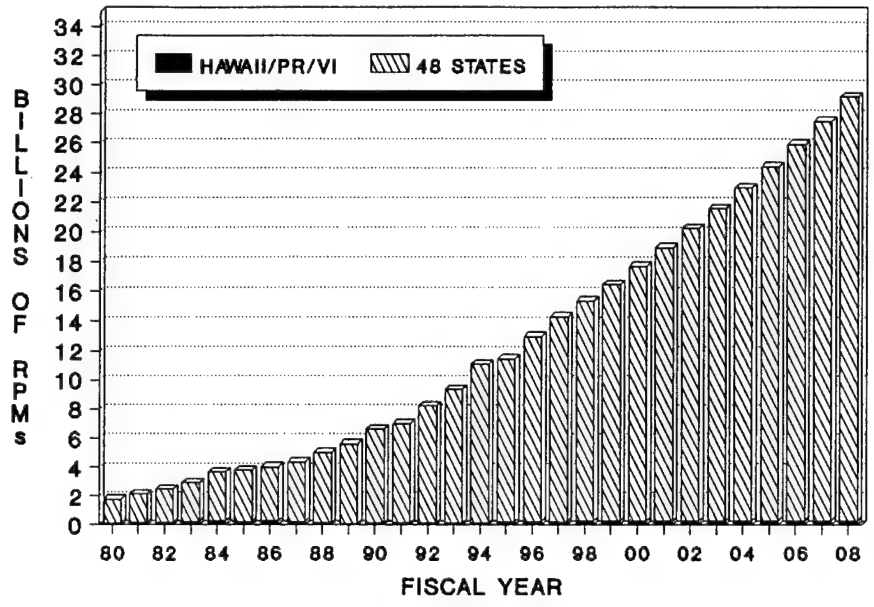
Passenger enplanements in Hawaii, Puerto Rico, and the Virgin Islands are projected to total 2.4 million in 1997 and 2.5 million 1998. Over the entire forecast period, enplanements are expected to increase at an average annual rate of 2.0 percent, totaling 2.9 million in 2008.

REGIONAL/COMMUTER FLEET

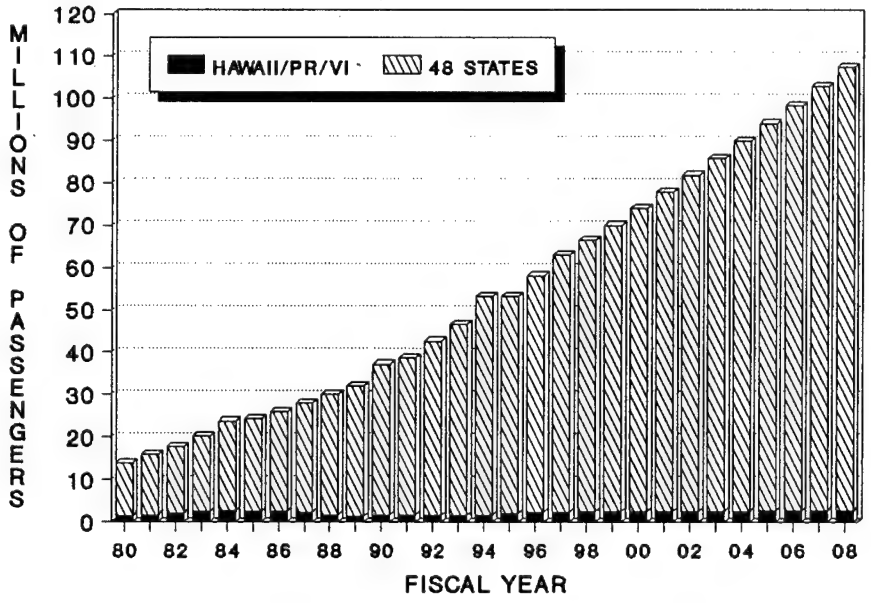
The current composition of the regional/ commuter fleet underscores the growth of the industry and quality of service provided. From a fleet once composed predominantly of general aviation-type aircraft, today's fleet is increasingly composed of new state-of-the-art aircraft offering amenities similar to those found on large jet aircraft. Today's

U.S. REGIONALS/COMMUTERS

SCHEDULED REVENUE PASSENGER MILES

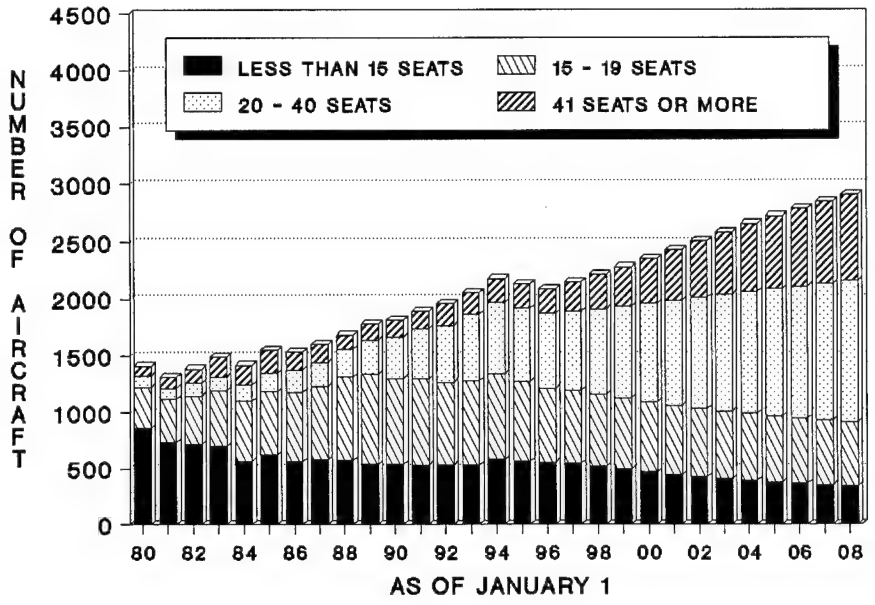


SCHEDULED PASSENGER ENPLANEMENTS

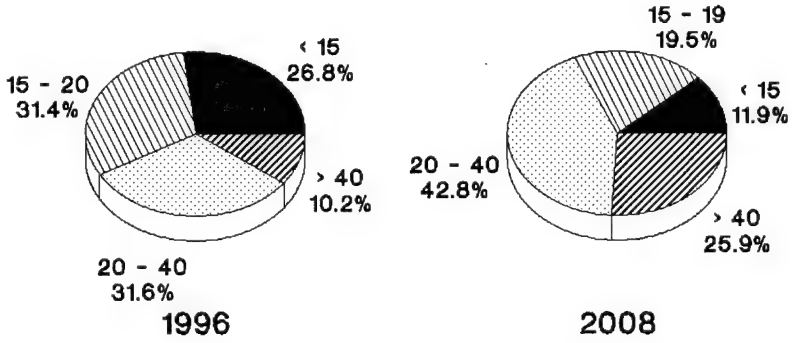


U.S. REGIONALS/COMMUTERS

PASSENGER AIRCRAFT



PERCENT BY AIRCRAFT SEAT SIZE



regional/commuter airlines have a large variety of aircraft from which to choose. Consequently, they can tailor their fleet to the specific markets they serve.

While there are numerous aircraft models to choose from in the four seat categories presented in this forecast, the most significant are the new aircraft with larger seating capacities--primarily the "20 to 40 seats" and the "greater than 40 seats" categories. The introduction of the larger new aircraft is reflected in the growth of the average seats per aircraft from 15.1 in 1980 to 23.9 in 1996, an increase of almost 57.3 percent.

During the forecast period, it is projected that the average seats per aircraft will increase from 30.5 seats in 1996 to 38.1 seats in 2008. During the same period, the regional/commuter fleet is projected to grow at an average annual rate of 2.8 percent, increasing from 2,090 aircraft in 1996 to 2,909 aircraft in 2008.

The number of regional aircraft having less than 15 seats--which once made up the bulk of the fleet (60.9 percent in 1980)--totaled only 560 in 1996, and accounted for slightly over one-quarter of the total regional fleet. Between 1996 and 2008, the number of aircraft in this category is expected to decline to 346. In 2008 this aircraft category will represent only 11.9 percent of the total fleet.

In 1996, the "15 to 19 seats" category accounted for the second largest portion of the fleet--31.4 percent. During the last 10 years, most of the growth of the regional/commuter fleet has occurred in this category. However, this group is expected to decline steadily over the current forecast period. It is projected that the "15 to 19 seats" category will decline from 656 aircraft in 1996 to 566 in 2008. However, this aircraft group will still account for 19.5 percent of the fleet in 2008.

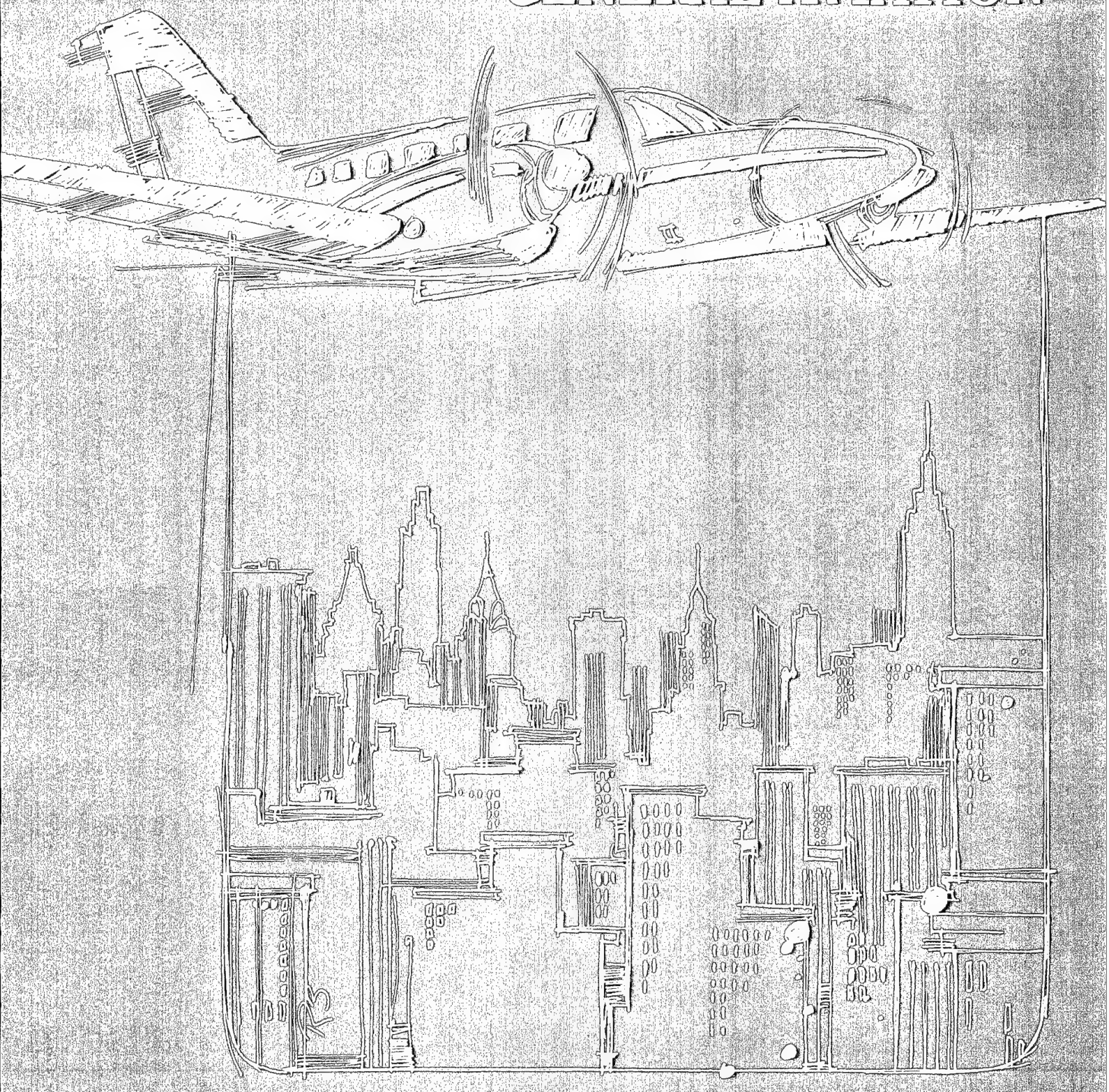
The greatest growth in the fleet is expected to occur in the "20 to 40 seats" and "greater than 40 seats" categories. This is due to the continued substitution of service and new route opportunities created through the use of larger, longer-range regional aircraft. In 1996, aircraft in the "20 to 40 seats" category accounted for 31.6 percent of the regional fleet, while aircraft in the "greater than 40 seats" category accounted for only 10.2 percent. By the year 2008, these two aircraft categories are expected to account for a combined 68.8 percent of the total fleet--42.8 percent in the "20 to 40 seats" category and 25.9 percent in the "greater than 40 seats" category. During the 12-year forecast period, aircraft in the "20 to 40 seats" category are forecast to increase from 661 aircraft in 1996 to 1,244 in 2008, an average annual increase of 5.4 percent. Aircraft in the "greater than 40 seats" category are expected to increase from 213 in 1996 to 753 in 2008, an average annual growth of 11.1 percent.

FLIGHT HOURS

Regional/commuter flight hours, as reported on BTS Form 298-C, totaled just over 2.4 million hours in 1996, down 14.1 percent compared to 1995, primarily reflecting a shift in reporting status of two large carriers. Industry flight hours are expected to increase 15.0 percent in 1997 to just under 2.8 million. This large increase is due to Mesa's return to Form 298-C status in 1997. During the 12-year forecast period, flight hours are forecast to increase at an average annual rate of 3.0 percent, and total over 3.4 million hours by 2008.

CHAPTER V

GENERAL AVIATION



CHAPTER V

GENERAL AVIATION

The term "general aviation" is used to describe a diverse range of aviation activities and includes all segments of the aviation industry except commercial air carriers (including commuter/ regional aircraft) and military. Its activities include the training of new pilots, sightseeing, the movement of large heavy loads by helicopter, and flying for corporate/business or personal reasons. Its aircraft range from a one-seat single engine piston to the long-range corporate jet.

General aviation is an important component of both the aviation industry and our national economy. It provides on-the-spot efficient and direct aviation services that commercial aviation cannot or will not provide. In addition, the production and sale of general aviation aircraft, avionics, and other equipment, along with the provision of support services such as flight schools, fixed base operators, finance, and insurance, make the general aviation industry an important contributor to the nation's economy.

According to the April 1995 update of *The Economic Impact of Civil Aviation on the U.S. Economy* (Wilber Smith Associates), the industry's contribution to the U.S. economy in 1993 was as follows:

- General aviation-related economic activity totaled $47.5 billion.
- General aviation and related activity employed nearly 529,000 people who earned $15.2 billion.
- General aviation accounts for 6.2 percent of aviation's total contribution ($771 billion) to the U.S. economy.

REVIEW OF 1996

In 1996, general aviation completed its second year of operations following the enactment of the General Aviation Revitalization Act of 1994. While 1995 represented the beginning of a period of renewed optimism for the general aviation industry, 1996 is the year in which the industry converted this optimism into constructive actions designed to stimulate the development and production of new general aviation products and services. What follows is a review of the industry's performance during 1996. Although the results in 1996 are mixed, they are, for the most part, positive and provide a firm base upon which to build for the future.

AIRCRAFT SHIPMENTS AND BILLINGS

In 1996 (all shipments and billings reported on a fiscal year basis), the number of general aviation aircraft shipments totaled 1,093, an increase of 6.3 percent. This marked the second consecutive year of increased demand for general aviation aircraft. Billings totaled only $2.7 billion in 1996, a decline of 8.5 percent from billings of $3.0 billion in 1995. The decline in billings reflects a change in the mix of aircraft sales, i.e., increased shipments of the generally lower-priced piston-powered aircraft and declining sales of the generally higher priced turbojets.

In fact, the market for piston-powered aircraft was up for a second consecutive year in 1996. During 1996, a total of 577 piston aircraft were shipped, an increase of 4.3 percent over 1995 and a 2-year increase of 25.1 percent. The market for turbine powered general aviation aircraft increased for a fourth consecutive year in 1996, up 8.6 percent to 516 aircraft. Turboprop aircraft shipments (285) were up 21.8 percent, while shipments of jet aircraft (231) declined 4.1 percent.

Exports of general aviation aircraft totaled 325 units in 1996, an increase of 9.4 percent. Export billings also increased in 1996, up 8.2 percent to 753.2 million. In 1996, exports accounted for 29.7 percent of the total general aviation aircraft shipments and 27.7 percent of total billings, up from 28.9 and 23.4 percent, respectively, in 1995.

PILOT POPULATION

As of January 1, 1996, the total pilot population was 639,184. This was nearly 15,000 fewer pilots than a year earlier when the number of pilots totaled 654,088, a decline of 2.3 percent. The four major pilot grouping--student, private, commercial, and airline transport--totaled 620,535 and accounted for 97.1 percent of all pilots in 1996.

Two of the four major groupings registered increases in 1996--airline transport and students. Of the two categories, the latter is certainly the more important of the two categories to the general aviation industry. The number of student pilots totaled 101,279 (up 5.2 percent) in 1996, the first increase recorded in this pilot category since 1990. These student pilots are the future of general aviation. The industry's efforts to revive the market for its products and services will, in large part, depend on how successful its programs are in attracting new pilots. In 1996, it appears that the industry-wide programs to attract new pilots are beginning to show positive results.

The number of airline transport pilots (123,877) was up 5.5 percent in 1996, the 39th consecutive year that this category has posted increased numbers. The other two major categories posted declines in 1996--private pilots (261,399, down 8.0 percent) and commercial pilots (133,980, down 3.4 percent).

The number of helicopter pilots (those holding helicopter certificates only) declined for a fourth consecutive years in 1996, down 17.4 percent to 7,183. However, the number of glider pilots (11,234) was up 32.2 percent, the eighth consecutive annual increase for this category of pilots. The number of recreational pilots (232) declined 3.7 percent in 1996.

The number of instrument rated pilots (298,798) has now declined for the last 3 years--down 1.2 percent in 1996 and 2.4 percent since 1993. Since 1984, however, this category of pilots is up 17.5 percent. In 1996, 46.7 percent of all pilots were instrument rated. This compares to 46.2 percent in 1995 and only 35.4 percent in 1984. These numbers reflect the increased sophistication of both the aircraft and pilots utilizing the National Airspace System.

OPERATIONS

General aviation activity at combined FAA and contract towered airports declined for a sixth consecutive year in 1996, down 1.9 percent to 35.3 million operations. Most of the decline in 1996 occurred in local operations (14.5 million), which were down 4.0 percent. Itinerant operations totaled 20.8 million in 1996, a decline of only 0.5 percent. Since 1990, local operations have declined 15.2 percent while itinerant operations are down 10.0 percent.

After increasing for the past 2 years, general aviation instrument operations at combined FAA and contract tower airports (17.9 million) declined 1.6 percent in 1996. General aviation activity at en route centers (7.8 million) was up 0.5 percent in 1996, the fourth consecutive year of increased activity for this workload measure. The increased levels of general aviation activity by the more sophisticated aircraft, combined with increased shipments of turboprop and turbojet aircraft, indicate the long awaited upturn in business/corporate flying may be underway.

1995 GENERAL AVIATION AND AIR TAXI ACTIVITY AND AVIONICS SURVEY

The historical general aviation active fleet and hours flown discussed in this chapter and Chapter VI (Helicopters) are derived from the General Aviation and Air Taxi Activity and Avionics Survey that is conducted annually by the FAA's Statistics and Forecast Branch. The fleet data are estimated using a sample from the FAA Aircraft Registry. As in any sample survey, variability could be caused by traditional sampling error and/or by nonsampling errors such as the quality of the responses, or who responds. With small groups (such as, rotorcraft, turbojets, etc.) the estimates are heavily influenced not only by the number of respondents, but also by who responds. For example, if a large operator chooses to respond or not to respond, the activity estimates for that particular aircraft type would significantly increase or decrease just by virtue of the fact that that operator responded or did not.

Several changes have been made to the survey which have caused some discontinuities in the historical series beginning in 1993. Commuter aircraft were excluded from the 1993 survey for the first time. In addition, two new use categories were added to the survey--sightseeing and external load. Most of the sightseeing activity was included in the "aerial observation" category in prior years. The external load activity was previously included in the "other work" category.

Several new aircraft type categories were also added to the 1993 survey. Single-engine turboprop aircraft were separated from the "other" turboprop category. Turbine rotorcraft, formerly a separate category, was divided into single engine and multi-engine. Additionally, all aircraft with experimental airworthiness certificates were grouped together. Prior to 1993, these aircraft had been included within the other aircraft groupings.

The active fleet and hours flown results derived from the 1995 survey show significant increases from the estimates contained in the 1994 survey. The increase in the number of active aircraft (10,741) is substantially more than can be accounted for by the number of new aircraft shipments (1,077) in 1995. Some part of the increased activity recorded in the 1995 survey results are, as previously stated, due to variation resulting from sampling and nonsampling errors. In addition, there were several factors that may

have contributed to the large increases in the 1995 survey statistics. Among these are:

- A very intensive publicity campaign was mounted by a large contingent of the general aviation community. This campaign stressed the confidentiality of the individual survey responses and the importance of the survey data to each of the organizations and its members. This probably resulted in an improvement in the quality of the responses, i.e., respondents reported their true activity rather than reporting that the aircraft did not fly during the year.

- The strength and duration of the current U.S. economic expansion, along with increased consumer confidence, could have induced a large number of previously inactive aircraft owners to become active.

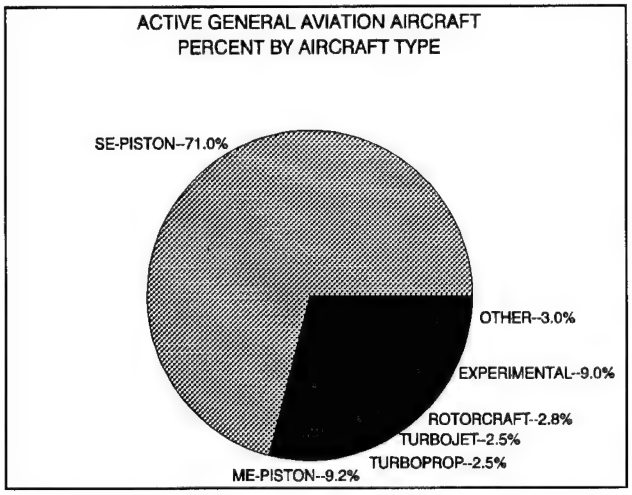
The active fleet and hours flown, by aircraft type and use category for the period 1991 to 1995, are detailed in tables on pages V-6 through V-9.

The 1995 survey results for active general aviation aircraft are reported as January 1, 1996 totals in Tables 22 and 23 (Chapter IX). The 1995 survey results for hours flown are listed in Table 24 (Chapter IX) as reported in the 1995 survey--as calendar year 1995.

ACTIVE AIRCRAFT

The "active fleet" consists of any aircraft flown at least one hour during the previous year. Based on the results of the 1995 survey (reported as January 1, 1996, in Tables 22 and 23), the general aviation active fleet totaled 181,341. This represents a 6.3 percent increase over the 170,600 active aircraft reported in the 1994 survey, the first recorded increase in the active fleet since 1992.

With the exception of the "other aircraft" category, all aircraft categories recorded increases in 1995. The number of single engine piston aircraft increased from 123,322 to 128,804 (up 4.4 percent), while the number of multi-engine piston aircraft increased from 15,577 to 16,649 (up 6.9 percent). The number of turboprop aircraft increased from 4,207 to 4,530 (up 7.7 percent) and the number of turbojet aircraft increased from 4,073 to 4,577 (up 12.4 percent).



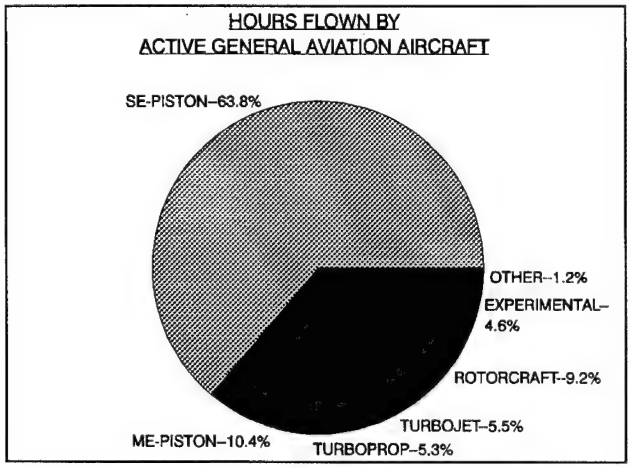
The largest increases in the number of active aircraft were recorded by the experimental and rotorcraft categories, up 27.4 and 16.5 percent, respectively. Experimental aircraft were first reported in the 1993 survey and totaled 10,938. The number of experimental aircraft increased to 12,852 (up 17.5 percent) in 1994 and to 16,382 in 1995. Within the experimental aircraft category--exhibition (1,841), "other" (3,576), and amateur builts (10,964) all registered increases--up 227.6, 29.2 and 15.1 percent, respectively.

The number of active rotorcraft totaled 5,117 in 1995. Both categories of rotorcraft--turbine-powered (3,643) and piston-powered (1,474)--recorded increases in 1995, up 21.1 and 6.7 percent, respectively.

The "other aircraft" category declined by 14.4 percent in 1995, from 6,169 to 5,279 aircraft. This consisted of 1,905 gliders (down 28.9 percent) and 3,374 lighter-than-air aircraft (down 3.4 percent).

HOURS FLOWN

The total hours flown by general aviation (25.4 million) were up 6.6 percent in 1995, the first recorded increase in hours flown since 1989. As with the active aircraft counts, only one aircraft category recorded a decline in the number of hours flown during 1995--"other aircraft" (0.3 million hours, down 24.8 percent). The number of hours flown by single engine piston aircraft (16.2 million) increased 3.1 percent while multi-engine piston aircraft hours (2.6 million) were up 1.3 percent.



The number of hours flown by fixed wing turbine aircraft (2.7 million) were up 17.1 percent in 1995. This consisted of 1.4 million hours by turboprop aircraft (up 22.6 percent) and 1.4 million hours by turbojet aircraft (up 12.2 percent). Rotorcraft hours flown (2.3 million) increased 16.2 percent in 1995, consisting of 2.0 million hours on turbine-powered aircraft (up 19.6 percent) and 0.3 million hours on piston-powered aircraft (up 0.3 percent). The number of hours flown by experimental aircraft (1.2 million) increased 62.0 percent in 1995.

PRIMARY USE OF AIRCRAFT

Based on the number of hours flown, personal use continues to be the major reason given for general aviation activity. In 1995, personal flying accounted for 35.9 percent of general aviation activity, up from 34.0 percent in 1994. Equally important, however, is the fact that the number of hours flown by this category has now increased for two consecutive years, from 7.9 million hours in 1993 to 8.1 million hours (up 2.2 percent) in 1994 and to 9.1 million hours (up 12.5 percent) in 1995.

The number of hours flown by the second largest use category, instructional flying (14.9 percent), declined 8.9 percent in 1995, from 4.2 to 3.9 million. The steady decline reported in this use category should be of major concern to the general aviation community. Since 1990, the number of instructional hours flown has declined by 47.7 percent. In 1990, instructional flying accounted for 23.5 percent of all general aviation hours flown. Without increased instructional flying to train a new generation of general aviation pilots, the future of the general aviation industry is in jeopardy. However, the increase recorded in the number of student pilots in 1996 (up 5.2 percent) could presage a possible turnaround in this critical use category.

The number of hours flown by the combined use categories of business and corporate flying increased 12.3 percent in 1995, from 5.6 to 6.3 million. These two use categories accounted for 24.7 percent of total general aviation activity in 1995, up from 23.3 percent in 1994. The total hours recorded for the business use category increased from 3.0 to 3.3 million (up 7.5 percent), while its percentage of total activity increased from 12.6 to 12.9 percent. The hours recorded for the corporate use category

TABLE V-1

GENERAL AVIATION ACTIVE AIRCRAFT BY AIRCRAFT TYPE (In Thousands)

AIRCRAFT TYPE	1995	1994	1993	1992	1991
Fixed Wing - Total	154.6	147.2	155.3	170.8	184.6
Piston -- Total	145.5	138.9	147.1	162.1	175.3
One Engine	128.8	123.3	130.7	143.6	154.1
Two Engine	16.6	15.5	16.4	18.5	21.1
Other Piston	0.1	0.1	0.0	0.1	0.1
Turboprop -- Total	4.5	4.2	4.4	4.7	4.9
Single Engine	0.7	0.6	0.7	N/A	N/A
Two Engine	3.8	3.6	3.6	4.1	4.4
Other Turboprop	0.0	0.0	0.2	0.2	0.3
Turbojet -- Total	4.6	4.1	3.9	4.0	4.4
Two Engine	4.3	3.9	3.7	3.8	4.1
Other Turbojet	0.3	0.2	0.2	0.2	0.3
Rotorcraft -- Total	5.1	4.4	4.5	5.8	6.3
Piston	1.5	1.4	1.6	2.2	2.5
Turbine	3.6	3.0	2.8	3.5	3.8
Single Engine	2.8	2.3	2.1	N/A	N/A
Multi-engine	0.9	0.7	0.7	N/A	N/A
Other -- Total	5.3	6.2	5.2	7.8	7.6
Experimental -- Total	16.4	12.9	10.9	N/A	N/A
Total All Aircraft	181.3	170.6	175.9	183.6	197.8

SOURCE: 1991-1995 General Aviation Activity and Avionics Surveys.

N/A = Not applicable. Prior to 1993 Single Engine Turboprops were included in "Other Turboprop". Experimental aircraft were included in one of the other aircraft types, as appropriate.

Note:
Commuter aircraft were excluded from the survey beginning in 1993. Commuter aircraft in 1991 - 1992 were as follows: 1991= 700; and 1992= 800.

TABLE V-2

TOTAL GENERAL AVIATION HOURS FLOWN BY AIRCRAFT TYPE (In Thousands)

AIRCRAFT TYPE	1995	1994	1993	1992	1991
Fixed Wing - Total	21,634	20,717	21,421	23,801	26,851
Piston -- Total	18,886	18,370	19,029	21,251	24,102
One Engine	16,246	15,765	16,514	18,074	20,540
Two Engine	2,636	2,597	2,514	3,172	3,555
Other Piston	3	8	1	4	7
Turboprop -- Total	1,356	1,106	1,227	1,478	1,513
Single Engine	273	207	244	N/A	N/A
Two Engine	1069	899	979	1,238	1,359
Other Turboprop	14	0	3	240	154
Turbojet -- Total	1,392	1,241	1,165	1,072	1,236
Two Engine	1,326	1,197	1,126	1,030	1,183
Other Turbojet	65	44	39	42	54
Rotorcraft -- Total	2,333	2,006	1,832	2,283	2,757
Piston	341	340	370	416	585
Turbine	1,992	1,666	1,462	1,866	2,172
Single Engine	1,450	1,197	1,073	N/A	N/A
Multi-engine	541	469	389	N/A	N/A
Other -- Total	319	424	376	410	459
Experimental -- Total	1,162	718	711	N/A	N/A
Total All Aircraft	25,447	23,866	24,340	25,800	29,497

SOURCE: 1991-1995 General Aviation Activity and Avionics Surveys.

N/A = Not applicable. Prior to 1993 Single Engine Turboprops were included in "Other Turboprop". Experimental aircraft were included in one of the other aircraft types, as appropriate.

Note:
Commuter aircraft were excluded from the survey beginning in 1993. Total hours for commuter aircraft in 1991 - 1992 were as follows: 1991 = 570,000; and 1992 = 693,000.

TABLE V-3

GENERAL AVIATION ACTIVE AIRCRAFT BY PRIMARY USE CATEGORY (In Thousands)

Use Category	1995	1994	1993	1992	1991
Corporate	9.9	9.7	9.9	9.4	10.0
Business	26.0	25.6	27.8	28.9	31.6
Personal	108.5	100.8	102.1	108.7	115.1
Instructional	14.4	14.6	15.6	16.0	17.9
Aerial Application	4.9	4.2	5.0	5.1	7.0
Aerial Observation	4.5	4.9	4.8	5.6	5.1
External Load	.2	0.1	0.1	N/A	N/A
Other Work	1.2	1.2	1.0	1.7	1.7
Sightseeing	1.0	1.3	1.6	N/A	N/A
Air Tours	0.3	N/A	N/A	N/A	N/A
Air Taxi	4.0	3.9	3.8	4.6	5.5
Other	6.4	4.2	4.2	3.5	3.9
TOTAL	181.3	170.6	175.9	183.6	198.5

SOURCE: 1991-1995 General Aviation Activity and Avionics Surveys.

N/A = Not applicable. Sight Seeing and External Load added in 1993 as new use categories. Prior to 1993 these aircraft were included in one of the other nine use categories, as appropriate.

Note:
Commuter aircraft were excluded from the survey beginning in 1993. Commuter aircraft in 1991 - 1992 were as follows: 1991 = 700; and 1992 = 800.

Columns may not add to totals due to rounding and estimation procedures.

TABLE V-4

TOTAL GENERAL AVIATION HOURS FLOWN BY PRIMARY USE CATEGORY (In Thousands)

Use Category	1995	1994	1993	1992	1991
Corporate	3,007	2,548	2,659	2,262	2,617
Business	3,283	3,005	3,345	3,537	4,154
Personal	9,129	8,116	7,938	8,592	9,685
Instructional	3,788	4,156	4,680	5,340	6,141
Aerial Application	1,349	1,210	1,167	1,296	1,911
Aerial Observation	1,467	1,750	1,750	1,730	1,797
External Load	156	172	105	N/A	N/A
Other Work	261	226	175	343	471
Sightseeing	219	323	412	N/A	N/A
Air Tours	177	N/A	N/A	N/A	N/A
Air Taxi	1,515	1,670	1452	2,009	2,241
Other	1,097	640	656	358	473
TOTAL	25,447	23,866	24,340	25,800	29,497

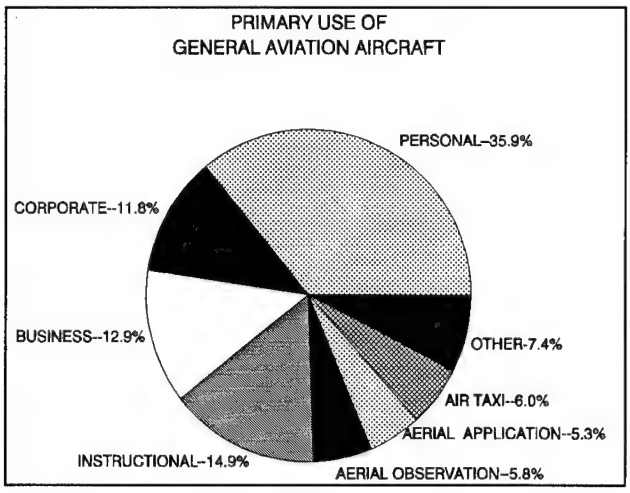
SOURCE: 1991-1995 General Aviation Activity and Avionics Surveys.

N/A = Not applicable. Sight Seeing and External Load added in 1993 as new use categories. Prior to 1993 these aircraft were included in one of the other nine use categories, as appropriate.

Note:
Commuter aircraft were excluded from the survey beginning in 1993. Total hours for commuter aircraft in 1991 - 1992 were as follows: 1991 = 570,000; and
1992 = 693,000.

Columns may not add to totals due to rounding and estimation procedures.

increased from 2.5 to 3.0 million, up 18.0 percent. Corporate flying accounted for 11.8 percent of general aviation activity in 1995, up sharply from 10.7 percent in 1994.



Other use categories recording increased hours flown in 1995 include aerial application (1.3 million, up 11.5 percent), "other work" (0.3 million, up 15.4 percent), and "other use" (1.1 million, up 71.4 percent). Other use categories recording declining hours in 1995 include aerial observation (1.5 million, down 16.2 percent), external load (0.2 million. down 9.3 percent), sightseeing (0.2 million, down 32.2 percent), and air taxi (1.5 million, down 9.3 percent). Air tours, a new use category in 1995, recorded 0.2 million hours.

REVITALIZATION OF AN INDUSTRY

General aviation continues to be a dominant force in aviation. In 1995, there were 672 airports with commercial service certificates (also used by general aviation) and a total of 17,671 airports/heliports used exclusively by general aviation aircraft. In terms of active aircraft, there were a total of 181,341 active general aviation aircraft in 1996 compared to 4,774 commercial jet aircraft and 2,090 regional/ commuter aircraft.

Of the 639,184 certificated pilots in 1996, general aviation accounted for 80 percent of the total. In 1995, general aviation operations totaled 93.8 million, over 73 percent of the total 129.7 million towered and nontowered operations at U.S. airports.

REASONS FOR OPTIMISM

There are a number of bright spots on the horizon that may lead to improvements in the general aviation industry in 1997 and beyond. There is a renewed optimism among the pilot community, aircraft manufacturers, and the industry as a whole that can be directly attributed to the passage of product liability reform legislation in 1994. This renewed optimism is stimulating enthusiasm and new products throughout the industry.

There is renewed interest and optimism among U.S. aircraft manufacturers. Cessna, for example, has committed to reentering the single engine piston aircraft market. When the first new aircraft is rolled out in early 1997, it will be the first new piston engine aircraft Cessna has produced since 1986. Piper Aircraft, which is emerging from Chapter 11 bankruptcy protection, has also begun increasing production. Other aircraft manufacturers are also increasing their production schedules for the future to meet the expected renewed demand.

Additionally, the market for good used aircraft has remained strong, and the amateur-built aircraft market has shown steady growth for years. The strength of the used aircraft market and the success of the kit aircraft market demonstrates that demand still exists for affordable aircraft.

The number of amateur-built experimental aircraft in the general aviation fleet has increased consistently over the last 25 years, from a total of 2,100 in 1970 to almost 23,000 today. It is estimated that about one half of these aircraft are active aircraft. The popularity of the amateur-built aircraft results from several factors, including:

- *Affordability*. Amateur-built aircraft are substantially less expensive than new production aircraft (aircraft produced under a type and production certificate) because of the large amount of labor that the builder provides.

- *Performance*. Many amateur-built aircraft have superior speed, maneuverability, fuel economy, and/or handling characteristics compared to light production aircraft. In many cases, the performance benefits are due to features and technologies not available on used, or even most new production aircraft. These benefits include the following:

    - new technology engines,

    - low-drag, natural laminar flow wings and carefully contoured fuselage aerodynamics, and

    - very smooth surfaces held to high tolerances and crafted from advanced composite technologies.

These aircraft represent the test-bed for new technologies which will eventually be introduced in the development and manufacture of the next generation of light general aviation production aircraft.

Although total general aviation activity at FAA towered airports has declined substantially since 1978, general aviation instrument operations at FAA towered airports have actually increased 9.1 percent since that time. Additionally, the number of general aviation aircraft handled at FAA en route centers increased 0.5 percent in 1996, the fifth consecutive year of increase. These two statistics point to continued growth among the more sophisticated general aviation users using the National Airspace System.

In addition, general aviation operations at non-towered airports are up 6.8 percent since 1978. This lends some support to those who contend that much of general aviation has, because of increased commercial air carrier activity, been forced out of many towered airports. This also supports the results of the General Aviation Activity Survey, which shows that personal flying has increased as a percentage of total general aviation activity--from 27.2 percent in 1985 to 35.9 percent in 1995.

FAA/Government Programs/Initiatives

There is a growing climate of partnership between the FAA and the general aviation community. In February 1996, the FAA and the European Joint Aviation Authorities (JAA) developed a new set of common harmonization standards for U.S. and European small airplanes. The joint program, which began in February 1991, is aimed at making the FAA's Federal Aviation Regulations (FAR) and the JAA's Joint Aviation Regulations (JAR) compatible for small airplanes seeking type certification.

The standards, which apply to new-type aircraft weighing less than 12,500 pounds, are directed toward expediting the certification process and increasing safety standards. The new rules are expected to simplify U.S. aircraft manufacturers' work by relieving them of the need to comply with one design standard for the U.S. and a different design standard for each country that is a member of the JAA.

In addition, the FAA is continuing to expend considerable effort cooperating with aviation

authorities in Russia, China, and elsewhere to develop common aviation standards. These initiatives, combined with efforts by industry, could tap vast new markets for general aviation products in places where general aviation does not currently exist.

There is also a growing effort to unlock general aviation's transportation potential through product innovation. In this area, the FAA and the National Aeronautics and Space Administration (NASA) have collaborated with the general aviation community to implement a research program aimed at fostering new technologies in general aviation. This program is called the Advanced General Aviation Transport Experiments (AGATE) Consortium, a unique partnership between government, industry, and academia that was established to help revive the general aviation industry.

For the third year, NASA and the FAA are sponsoring a General Aviation Design Competition for students at U.S. aeronautical and engineering universities. This competition allows students to participate in the monumental rebuilding effort of this country's general aviation sector by attempting to design their own general aviation aircraft in a manner that focuses on current design challenges.

Another example of the programs involving new technology are the two recent contracts signed in September 1996 between NASA and several industry leaders to develop technologies for new intermittent and turbine engines. Under the support of NASA's General Aviation Propulsion (GAP) program, two companies have been selected to begin 3-year design projects for new, smoother, quieter, and more affordable engines. The hope is for NASA, aircraft manufacturers, and supplier industries to work together and share their technical expertise, financial resources, and facilities to demonstrate new general aviation propulsion systems.

Teledyne Continental Motors (TCM) and NASA will work to design a revolutionary intermittent combustion aircraft engine. The new engine design is to be used in the development of an entry-level, single-engine general aviation aircraft with four seats and a cruising airspeed of 200 knots or less.

Williams International and NASA will begin work in a new cooperative program to develop an ultra quiet, efficient turbofan engine with low exhaust emission. The modern engine design will be used on both single and multi-engine aircraft. The new design is expected to improve the cruise speed and range of general aviation aircraft.

Manufacturer and Industry Programs/Initiatives

Over the past several years, the general aviation industry has launched a series of new programs and initiatives whose main goals are to promote and assure future growth within the industry. These include the "No Plane No Gain" campaign sponsored jointly by the General Aviation Manufacturers Association (GAMA) and the National Business Aircraft Association; "Project Pilot" sponsored by the Aircraft Owners and Pilots Association (AOPA); and the "Learn to Fly" campaign sponsored by the National Air Transportation Association (NATA).

Another new industry program is the Piston Engine Aircraft Revitalization Committee, sponsored by GAMA. This committee has worked diligently for the past 12 months with the goal of finding new methods of expansion and growth for the general aviation industry. The committee included senior managers and directors from GAMA members, aviation organizations, academic institutions, and the FAA. The committee has projected that there are approximately 1.2 million individuals--(900,000 men and 300,000 women)--interested in flying. According to the committee's findings,

57 percent of the potential pilots are between the ages of 25 and 40.

In addition to these four programs, there is "GA Team 2000," a program sponsored jointly by AOPA and GAMA. Scheduled to begin in Spring 1997, extensive planning is already under way.

The goals of "GA Team 2000" are multi-faceted: to revitalize the influx of new pilots, to generate flight training leads, to encourage improvement in flight school marketing and training infrastructure, and to secure additional funding to expand the "GA Team 2000" effort. The ultimate goal is 100,000 annual student starts by the year 2000.

The New Piper Aircraft, which recently emerged from bankruptcy, has scheduled increases in its employment and production schedules and has entered into the financial business with the creation of Piper Financial Services (PFS). PFS offers competitive interest rates for the potential purchase and/or leasing of Piper aircraft.

On July 3, 1996, Cessna dedicated its new assembly plant in Independence, Kansas, and has scheduled the first aircraft delivery in early 1997. The goal of the new plant is to produce 1,000 aircraft by year-end 1997 and an additional 2,000 aircraft in 1998. In an attempt to entice potential buyers, Cessna is accepting refundable deposits for non-transferable position reservations for its new aircraft.

The industry is also seeking to increase the number of lending institutions that offer special low, competitive rates for aircraft financing. Popularity also continues to grow for those programs aimed at the fractional ownership of general aviation aircraft. The programs have greatly increased the accessibility to aircraft ownership for many who could not otherwise afford it. Two companies currently offering fractional ownership programs are Executive Jet Aviation and KC Aviation.

RISKS AND UNCERTAINTIES

The assumptions of sustained moderate economic growth and stable fuel prices are central to the forecast of growth in the general aviation industry. Other significant factors to be considered are environmental regulations, especially as they relate noise and emission standards and their potential impact on aircraft operating costs. The piston powered airplane segment of the general aviation industry is particularly price sensitive. Pilots generally fly more hours when the economy is expanding. The benefits of the numerous FAA and industry initiatives under way to promote the growth of general aviation are, for the most part, long-term in nature and their impacts are not expected to be felt for several years. This is reflected in the forecasts that follow, which predict that the industry will experience several additional years of relatively stagnant or slow growth before the turn-around begins around the turn of the century.

GENERAL AVIATION FORECASTS

The general aviation forecasts discussed in the following paragraphs are based on a set of assumptions, not the least of which is the outlook for moderate and sustained economic growth in the United States. The forecasts also assume that legislation enacted in 1994 limiting the liability of manufacturers of general aviation aircraft will have its greatest impact on the general aviation fleet during the 1999-2000 time frame. While growth in general aviation activity will, to some degree, be driven by an expanding U.S. economy, the actual rate of growth will depend on how successful the industry is in stimulating the development of new general aviation products and services. To the extent

that industry and government programs/ initiatives are successful in revitalizing the market for general aviation products and services, the forecasts discussed in the followings pages are likely to be met or possibly exceeded. If the industry's programs are not successful, the actual active general aviation fleet and hours flown will be considerably lower than forecast.

The output from the Transportation Research Board's (TRB) 9th Annual International Workshop (September 18-20, 1995) were used extensively in preparing last year's general aviation forecasts. Many of the assumptions developed at the 1995 workshop were also incorporated into this year's forecasts, this after adjusting for the availability of an additional year's data. The findings and conclusions of the workshop, including the three panels on general aviation (Light General Aviation, Business Aviation, and Vertical Flight), are available in Transportation Research Circular Number 454 (February 1996) from the TRB.

ACTIVE FLEET

The active general aviation aircraft fleet is expected to increase at an average annual rate of 0.8 percent over the 12-year forecast period, with the number of active aircraft increasing from 181,341 in 1996 to 196,600 in 2008. The general aviation fleet is forecast to increase only moderately (0.3 percent) in 1997, then expand by almost 2,000 aircraft (1.0 percent) annually over the next 4 years as increased aircraft production and new aircraft products enter the marketplace. Over the entire forecast period, the general aviation active fleet is expected to increase by almost 1,300 aircraft annually. These figures assume production of between 3,000 and 4,000 new general aviation aircraft annually and the retirement of approximately 2,000 older piston aircraft annually. The number of single engine piston active aircraft is projected to increase from 128,804 in 1996 to 139,500 in 2008, a net addition of almost 1,000 aircraft annually. Because of the current average age of the single engine piston fleet, large numbers of older piston aircraft are expected to be retired throughout the forecast period. Therefore, the net growth in the single engine piston category is expected to come largely from the purchase of new technology aircraft.

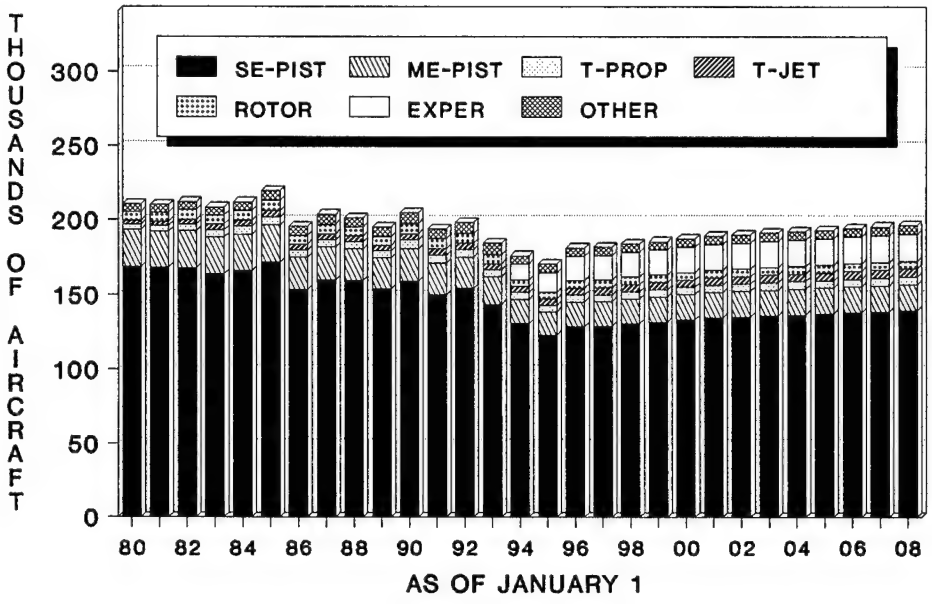
Multi-engine piston aircraft are expected to increase by just less than 1,000 aircraft over the entire 12-year forecast period, from 16,649 in 1996 to 17,400 in 2008. Most of the growth occurs during the 4-year period between 1998 and 2001 when purchases of new technology aircraft outpace retirements.

The active turbine-powered fleet is expected to grow throughout the forecast period (1.3 percent annually), largely the result of an expanding U.S. economy. The number of turboprop aircraft grows from 4,530 in 1996 to 5,200 in 2008. Turbojet aircraft are forecast to increase from 4,577 in 1996 to 5,400 in 2008.

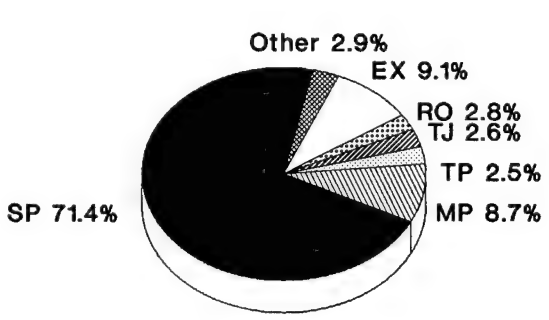
The rotorcraft fleet is forecast to decline slightly (0.5 percent annually) over the 12-year forecast period, from 5,117 in 1996 to 4,800 in 2008. All of the decline occurs in the piston rotorcraft fleet, which declines from 1,474 aircraft in 1996 to 1,200 aircraft in 2008. The active turbine rotorcraft fleet is expected to remain constant at approximately 3,600 aircraft throughout the forecast period.

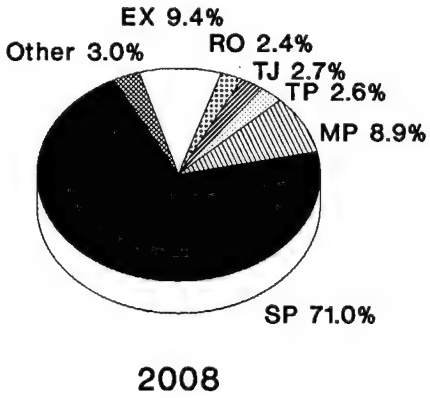
The number of experimental aircraft is projected to increase from 16,382 in 1996 to 18,400 in 2008, an average annual growth rate of 1.0 percent. Gliders and lighter-than-air aircraft are forecast to increase by 0.9 percent annually, growing from 5,279 in 1996 to 5,900 aircraft in 2008.

ACTIVE GENERAL AVIATION AND AIR TAXI AIRCRAFT



PERCENT BY AIRCRAFT TYPE

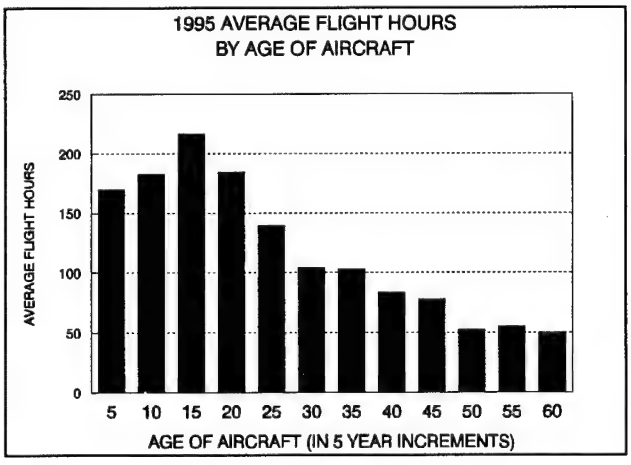




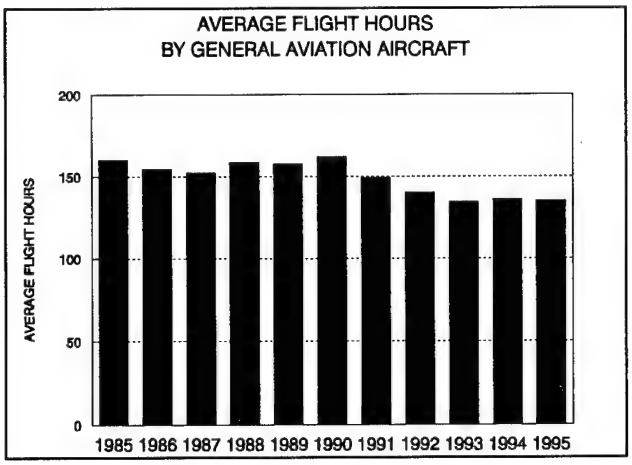
AIRCRAFT UTILIZATION

For years it has been assumed that the aging of the general aviation fleet was one of the main determinants of declining utilization of general aviation aircraft. It is estimated that the average age of the general aviation fleet was 26 years in 1995, with piston aircraft accounting for the majority of the aging fleet. Data from the 1995 survey shows that aircraft utilization peaks at 216 hours between 11 and 15 years and then declines substantially after an aircraft reaches 20 years of age. The aging of the fleet appears to be one of the main causes of declining utilization of general aviation aircraft.

During the 1990-93 time period, the average number of hours flown by general aviation aircraft declined significantly (17.1 percent), from 162.1 to 134.4 hours. While part of the decline can be attributed to the aging of the general aviation fleet; an equally large part is assumed to be the result of the U.S. economic slowdown/recession in 1990-91 and relatively slow economic recovery in 1992.



Aircraft utilization (135.3 hours in 1995) has increased slightly since 1993, up 0.7 percent. Part of the increase is the result of the strong U.S. economy. However, some part of the increase is also due to the fact that experimental aircraft (53 and 67 hours per aircraft in 1994 and 1995, respectively) is now separated from the other aircraft categories



Although the utilization rates of both the fixed wing piston and rotorcraft categories declined during 1995, both categories of the fixed wing turbine fleet reported increased utilization. The average number of hours flown by single (127.3) and multi-engine piston (155.5) aircraft declined by 0.9 and 5.8 percent, respectively, in 1995. After recording a 15.1 percent increase in 1994, rotorcraft utilization (439.2 hours) declined 4.2 percent in 1995. However, rotorcraft's utilization rate remains 10.2 percent above the rate achieved in 1993.

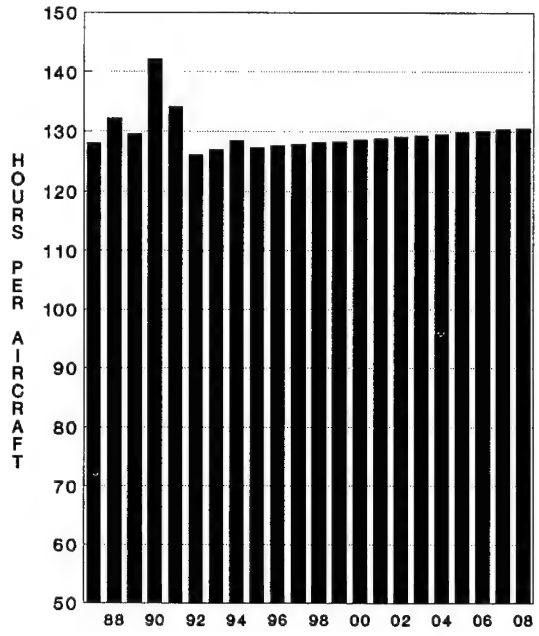
Turboprop (286.7 hours) and turbojet (316.4 hours) utilization rates both increased for the second consecutive year, up 8.7 and 2.3 percent, respectively, in 1995. Over the 2-year period, turboprop and turbojet aircraft utilization is up 26.0 and 6.0 percent, respectively.

Based on economic assumptions of moderate and sustained growth throughout the 12-year forecast period, it has been assumed that the average hours flown per aircraft will gradually return to utilization levels achieved prior to the 1990/1991 economic recession.

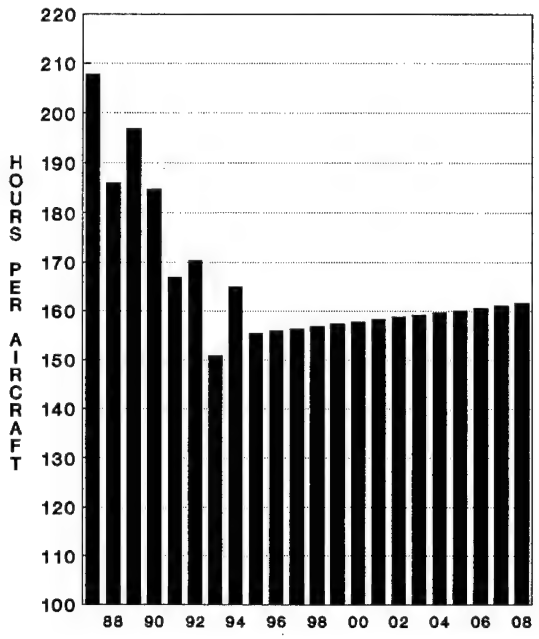
Single engine piston aircraft utilization is forecast to increase from 127.6 hours in 1996 to 130.6 hours in 2008, an annual increase of

GENERAL AVIATION AIRCRAFT UTILIZATION

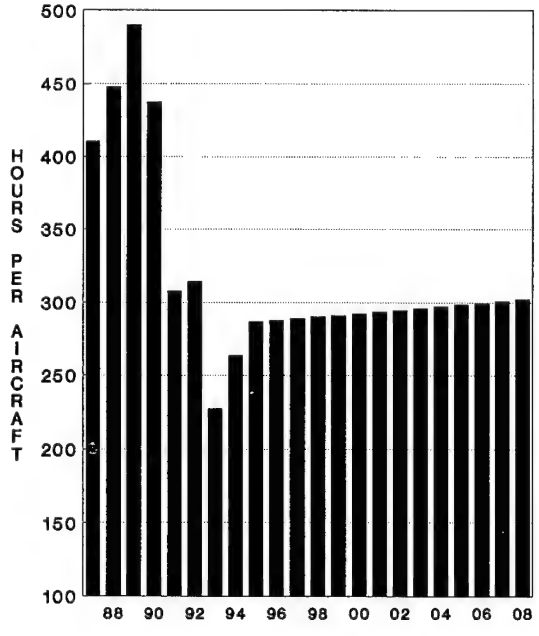
SINGLE ENGINE PISTON



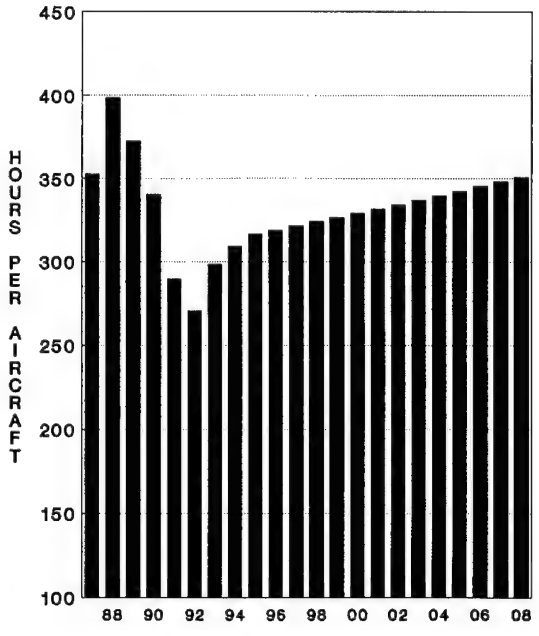
MULTI-ENGINE PISTON



TURBOPROPS



TURBOJETS



0.2 percent. Multi-engine piston aircraft utilization is also forecast to increase only gradually (0.3 percent annually) over the forecast period, from 156.0 hours in 1996 to 161.7 hours in 2008.

The average hours flown by turbine-powered aircraft is forecast to increase at an average annual rate of 0.7 percent over the forecast period. Turboprop aircraft utilization increases from 287.8 hours in 1996 to 302.0 hours in 2008. Turbojet hours grow from 318.9 to 350.9 over the same time period.

The average hours flown by rotorcraft is expected to increase by 0.5 percent annually over the 12-year forecast period. Piston rotorcraft utilization increases from 234.4 hours in 1996 to 243.0 hours in 2008. Turbine rotorcraft hours increase from 532.3 to 585.7 over the same time period.

HOURS FLOWN

Although the active general aviation fleet is expected to increase only slightly over the forecast period (up 0.7 percent annually), the projected increases in aircraft utilization results in a 1.0 percent annual increase in the number of hours flown. General aviation hours flown are projected to increase from an estimated 25.6 million in 1996 to 28.9 million in 2008.

Single engine piston aircraft hours flown are forecast to increase from 16.3 million in 1996 to 18.1 million in 2008, an average annual increase of 0.9 percent. Multi-engine piston aircraft hours increase from 2.6 million in 1996 to 2.8 million in 2008, a rate of 0.6 percent annually.

Turbine-powered aircraft hours flown are projected to increase from 2.9 million in 1996 to 3.7 million in 2008, an annual growth rate of 2.1 percent. Rotorcraft hours flown increase at an annual rate of 0.7 percent over the same time period, from 2.3 to 2.5 million.

Experimental aircraft hours flown are forecast to increase from 1.2 million in 1996 to 1.4 million in 2008, an annual growth rate of 1.3 percent. Hours flown by gliders and lighter-than-air aircraft are projected to increase by 2.4 percent annually, from 0.3 to 0.4 million over the forecast period.

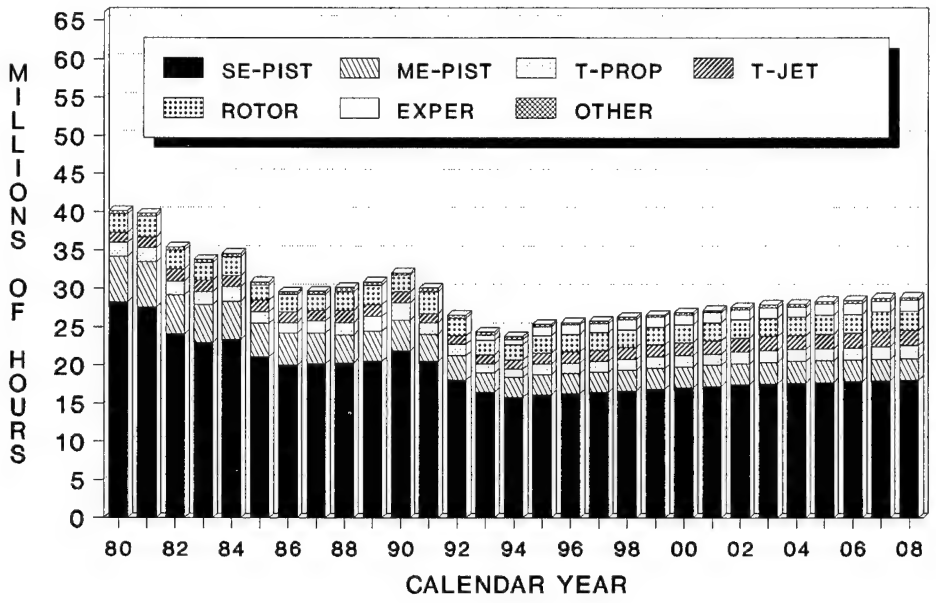
PILOT POPULATION

The total pilot population is projected to increase from 639,184 in 1996 to 712,600 by 2008, an annual increase of 0.9 percent. Student and recreational pilots are forecast to increase from 101,511 in 1996 to 117,700 in 2008, an annual growth rate of 1.2 percent for the 12-year forecast period. While some of the growth is in response to U.S. economic growth, much of the assumed growth is expected to result from industry-wide programs which are specifically designed to recruit new pilots to general aviation. The growth in student pilots also assumes growth in pilot training and flight schools which, in turn, implies future growth in the industry.

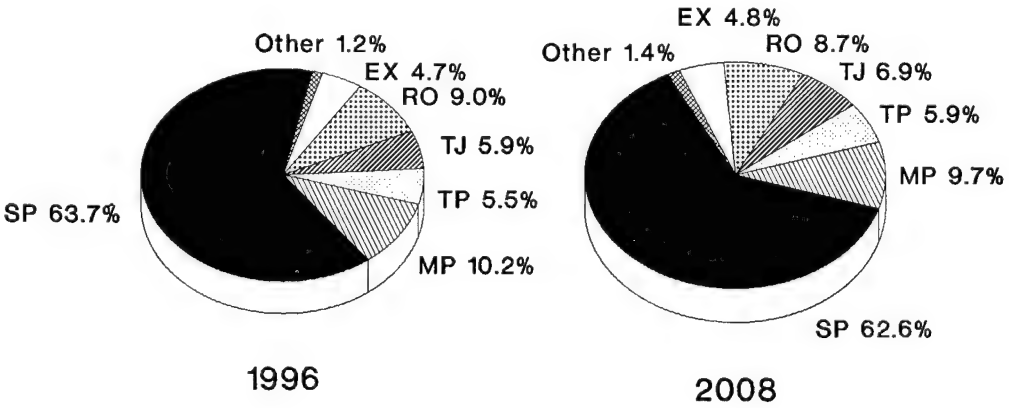
The projected 12-year growth for selected pilot categories include: private pilots, 0.8 percent annually; commercial pilots, 0.5 percent annually; airline transport pilots, 1.5 percent annually; helicopter (only), 0.6 percent annually; and glider (only), 0.4 percent annually.

The number of instrument rated pilots is expected to increase from 298,798 in 1996 to 338,900 in 2008, a 1.0 percent annual rate of growth. In 1996, 46.7 percent of all pilots were instrument rated. By 2008, the percentage of instrument rated pilots is projected to increase to 47.6 percent. This implies continued increases in the sophistication of the aircraft and pilots using the National Airspace System.

ACTIVE GENERAL AVIATION AND AIR TAXI HOURS FLOWN

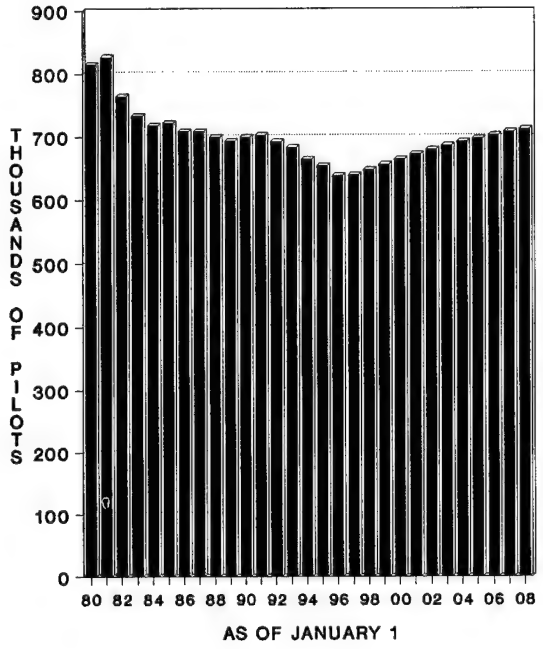


PERCENT BY AIRCRAFT TYPE

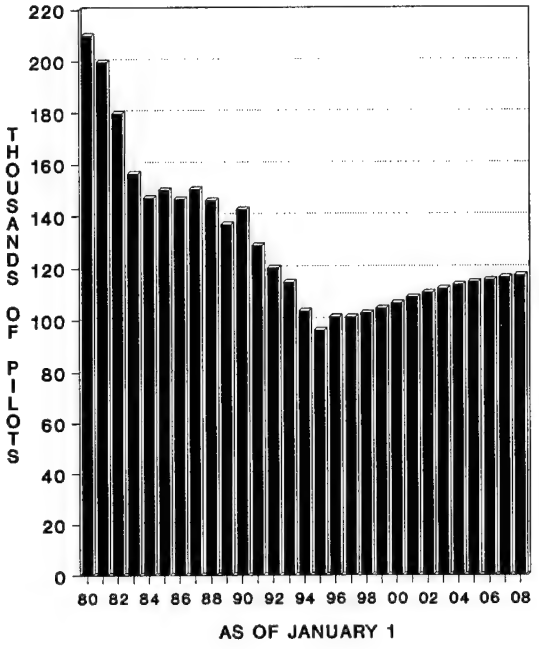


ACTIVE PILOT TRENDS AND FORECASTS

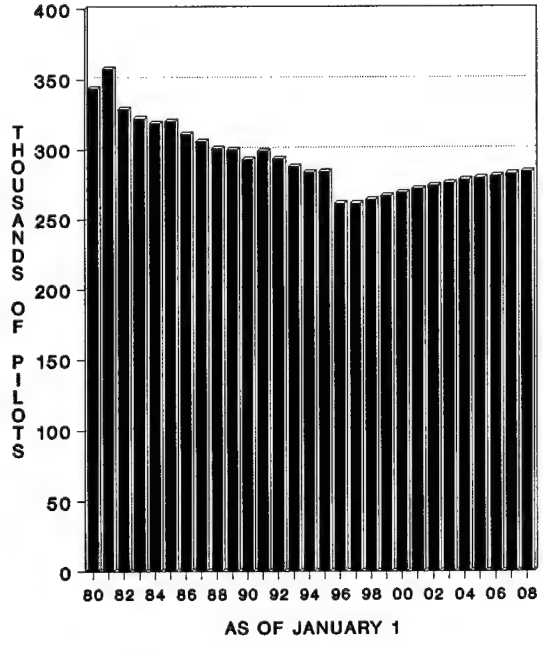
TOTAL PILOTS



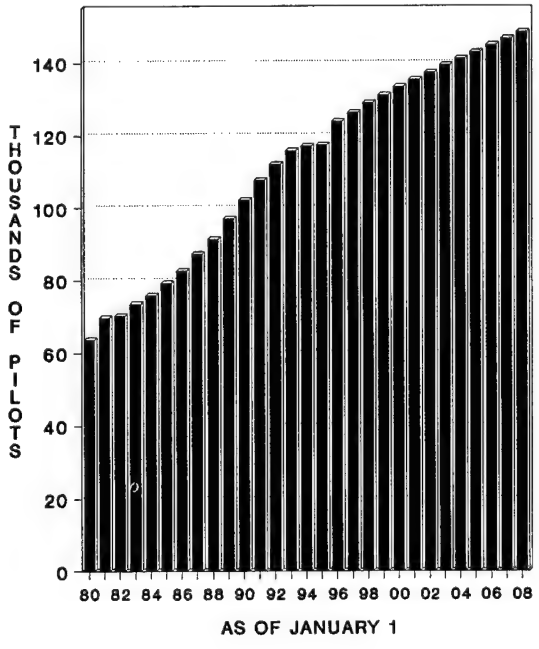
STUDENT PILOTS



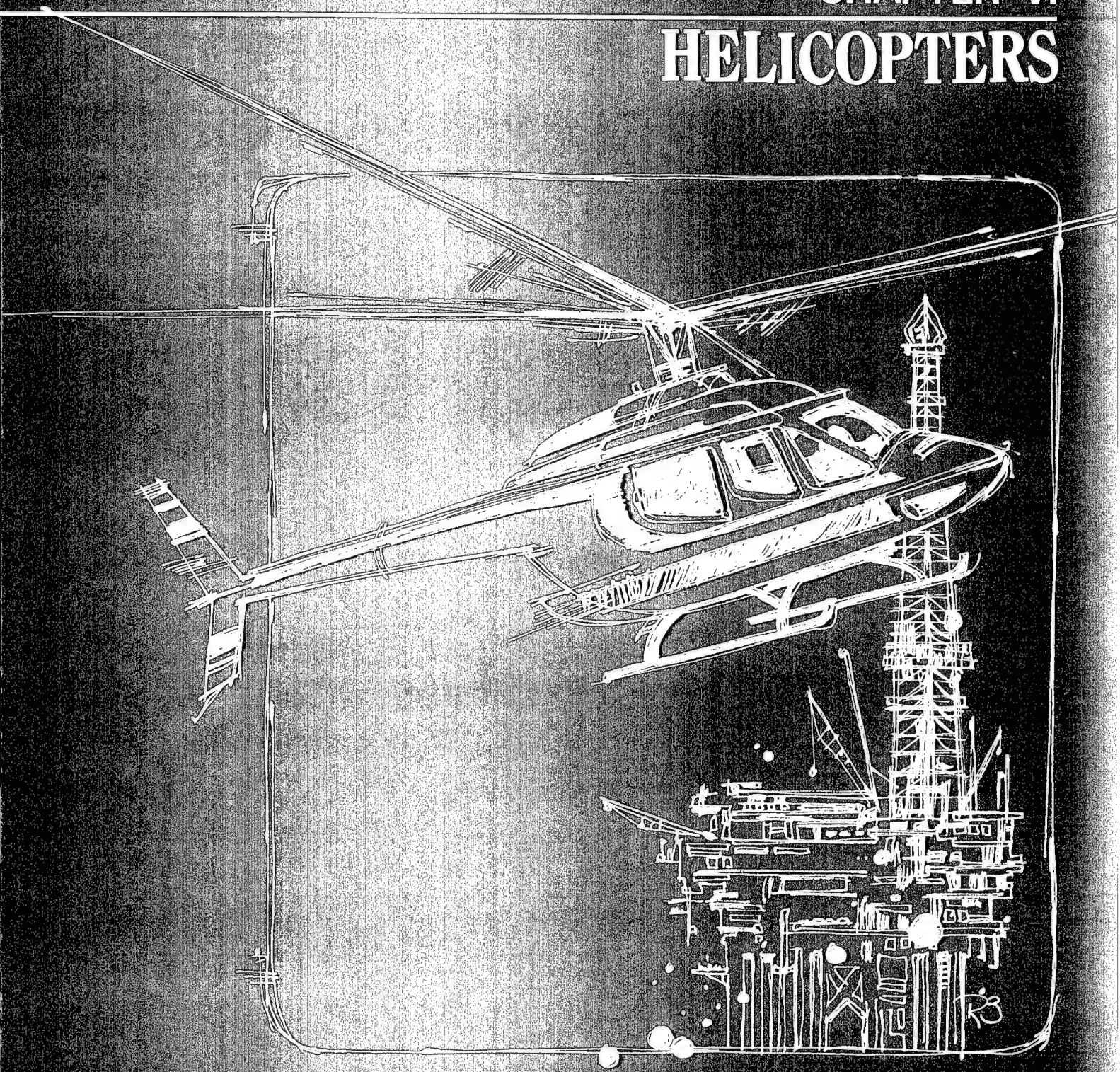
PRIVATE PILOTS



AIRLINE TRANSPORT PILOTS



CHAPTER VI
HELICOPTERS



CHAPTER VI

HELICOPTERS

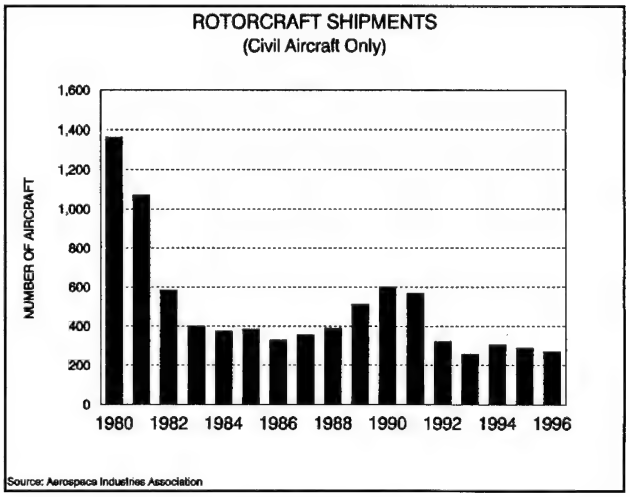
Diana Ross sang the national anthem at Super Bowl XXX sitting in the open cargo door of a McDonnell-Douglas Explorer. It picked her up in mid-song and hovered over the 50-yard line before taking off into the blue sky amid the sound of cheers, music, and a little blade slap.

Helicopters participate in a wide and diverse range of aviation activities all of which are important and contribute to the nation's economy. These activities include sightseeing, crop dusting, fire fighting, personal transportation, emergency medical services, transporting personnel and supplies to off-shore oil rigs, traffic reporting, corporate or business transportation, and the lifting of heavy loads.

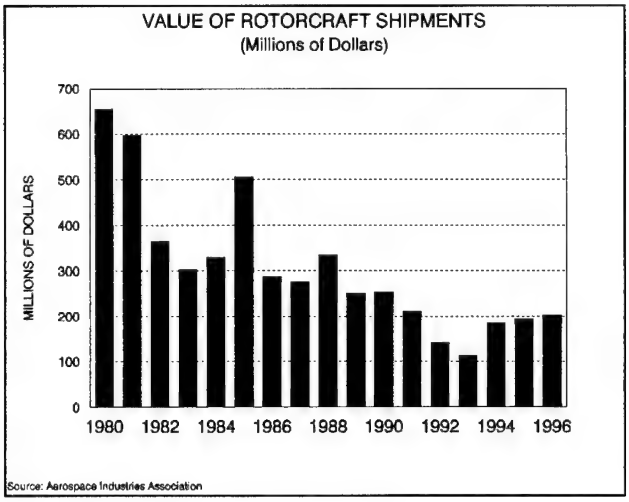
REVIEW OF 1996

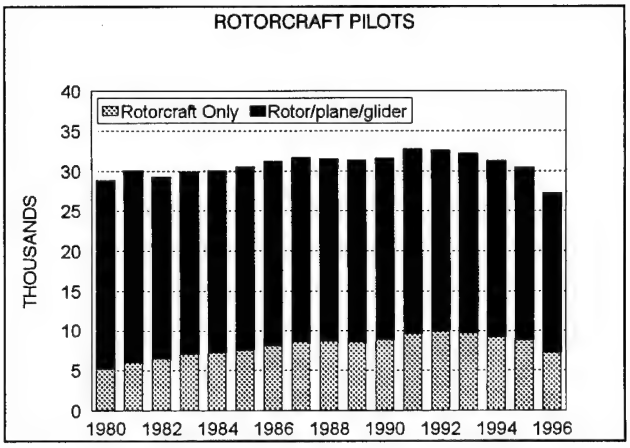
SHIPMENTS

Preliminary data for calendar year 1996 indicate that shipments of new U.S. civil helicopters will total 273 units. Compared to the 292 units shipped in 1995, this represents a decrease of 6.5 percent. When compared to the 1,366 units shipped in 1980, it shows that the market for civil helicopters has declined by 80 percent.



The value of the helicopter shipments totaled $203 million in 1996, an increase of 4.6 percent over billings of $194 million in 1995 The average value increased from $644,000 in 1995 to $744,000 in 1996. The large increase in the average value reflects an increase in the shipment of larger multi-engine turbine helicopters. These units are being used to replace aircraft in executive and off-shore service.





Although shipments have decreased over the last 2 years, the industry is still optimistic. The Aerospace Industries Association's *1996 Year-End Review and Forecast* projects an increase in the market for helicopters in 1997. Civil helicopter shipments are forecast to total 357 units in 1997 (up 30.8 percent). The sales value of these aircraft is expected to total $302 million in 1997, an increase of 48.8 percent.

PILOTS

The total number of rotorcraft pilots decreased from 30,448 in 1995 to 27,199 in 1996, a decline of 10.7 percent. This continues a downward trend that started in the early 1990s and parallels the trend in total pilots. The number of pilots who are certificated to fly only a rotorcraft also declined--from 8,719 in 1995 to 7,183 in 1996, a decline of 17.6 percent.

The total rotorcraft pilot population includes pilots who are certificated to operate only rotorcraft (helicopters and gyrocopters) and those that may operate a rotorcraft and an airplane and/or a glider. The rotorcraft pilot counts reported in Table 25 (Chapter IX) are pilots that are certificated to operate only rotorcraft.

1995 GENERAL AVIATION AND AIR TAXI ACTIVITY AND AVIONICS SURVEY

The historical rotorcraft active fleet and hours flown discussed in this chapter are derived from the General Aviation and Air Taxi Activity and Avionics Survey that is conducted annually by the FAA's Statistics and Forecast Branch The fleet and hours data are estimated using a sample from the FAA Aircraft Registry and are subject to variation due to errors in the Registry and sampling error.

A top-to-bottom review of the survey has resulted in changes that have caused discontinuities in the rotorcraft historical series beginning in 1993. Two new use categories--sightseeing and external load--were added. The sightseeing activity was included in either the aerial observation or air taxi activity in prior years. The external load activity was previously included in the other work category. In 1995, sightseeing was further divided into sightseeing under 14 CFR 91 (general aviation) and air tours under 14 CFR 135 (air taxi).

A new rotorcraft type category was also added. Turbine rotorcraft, formerly a single category, was divided into single-engine and multi-engine.

Additionally, all aircraft with an experimental airworthiness certificate were grouped together. Prior to 1993, these aircraft were included within the other aircraft groupings. The experimental aircraft account for about 20 percent of the rotorcraft fleet and fly substantially fewer hours each year. The elimination of these aircraft has had a significant impact on the activity estimates since 1993. The total population of rotorcraft decreased and therefore the number of active aircraft and flight hours also decreased. However, the average hours per aircraft increased. Experimental rotorcraft are now included in the "Experimental" aircraft category.

The 1995 survey results for active rotorcraft and hours flown are listed in Table 27 (Chapter IX). The 1995 survey results for active rotorcraft are reported as January 1, 1996, in the table. The 1995 survey results for rotorcraft hours flown are reported as calendar year 1995.

FLEET AND HOURS FLOWN

As of January 1, 1996, there were 5,117 active civil rotorcraft in the United States, a 16.6 percent increase from the 4,389 aircraft reported in 1995. In 1996 active turbine rotorcraft increased 21.1 percent, totaling 3,643 compared with 3,009 in 1995. Rotorcraft flew an estimated 2.3 million hours in 1995, a 15.0 percent increase over 1994's 2.0 million hours. Turbine rotorcraft flew 2.0 million hours in 1995 (up 19.5 percent), accounting for the vast majority (85 percent) of total rotorcraft hours. Hours flown by piston rotorcraft totaled 0.3 million, an increase of 0.3 percent.

In 1995, the rotorcraft fleet flew an average of 439 hours per active aircraft. Turbine rotorcraft averaged 528 hours per aircraft while piston rotorcraft averaged 234 hours. The data indicate a decrease in the utilization of the helicopter fleet of 19 hours or 4.2 percent for all helicopters. Turbine utilization declined 7.6 percent, while piston utilization declined 7.5 percent. The year-to-year fluctuations in these rates may depend on which helicopter owners/ operators responded to the survey.

PRIMARY USE OF AIRCRAFT

The leading use (21.4 percent) of all rotorcraft is aerial observation (pipeline patrol, traffic reporting, search and rescue, etc.), followed by corporate flying at 17.5 percent. For piston powered rotorcraft, the leading uses are instructional and personal flying and aerial application. These three uses account for almost 70 percent of piston rotorcraft hours. The top uses for the turbine rotorcraft are aerial observation and corporate flying, at about 24 percent each.

In terms of the number of hours flown, aerial observation and personal use rank first and second for all helicopters--608,000 and 465,000 hours respectively. For piston rotorcraft, instructional use accounted for the most hours (126,000), with aerial observation and aerial application ranking a close second and third. These uses account for about 85 percent of total piston hours.

FUEL CONSUMED

In 1995, fuel consumed by rotorcraft was estimated to be 64.6 million gallons, an increase of 17.2 percent over 1994. This increase largely reflects an increase in flight hours. Most of the rise in fuel consumption was in jet fuel (59.5 million gallons in 1995 compared to 50.0 million in 1994). The use of aviation gasoline increased slightly, up 2.0 percent or 100,000 gallons.

FUTURE ISSUES

OPERATION HELI-STAR

A joint FAA/NASA/industry (Heli-Star) team supported the 1996 Centennial Olympic Games, the State of Georgia, and the City of Atlanta in establishing and operating a visionary "highway in the sky" transportation system. This "first of its kind" system transported medical patients, passengers, and time sensitive cargo before, during, and after the Atlanta Olympics.

The joint group established two command centers and a 13-heliport ground infrastructure. In addition, the group designed, developed, and manufactured 50 sets of Automatic Dependent Surveillance-Broadcast (ADS-B) GPS-based equipment within 10 months of the initial FAA request. The Heli-Star team responded to an emergency security request by the National Security Council just 3 weeks before the Opening Ceremonies by designing, delivering, and installing an additional 60 units prior to the start of the events. These portable units permitted helicopters and blimps to operate within the Olympic security-controlled restricted airspace safely, transmitting TV footage and providing airborne command and control.

This 24-hour coverage for law enforcement and security patrol service was provided by Heli-Star's team of air traffic control specialists at the Traffic Advisory Center. Over 1,400 hours were flown accident free with equipped aircraft. Information provided to pilots included position, weather, obstacles and the position of other aircraft. An additional environmental benefit was the implementation of an aggressive "Fly Neighborly" Community Response System that used predetermined routes and precise navigation capability which minimized noise and intrusive impacts on Atlanta neighborhoods.

A follow-on Initial Operations Concept project will incorporate ADS-B technology in Hawaii and Alaska. The project will focus on the two States' unique aviation requirements.

AGGRESSIVE NEW PRODUCT DEVELOPMENT

Following a number of years in which a relatively flat market dampened rotorcraft manufacturers' interest in new product development, the mid 1990s have seen a worldwide resurgence in commercial helicopter start-ups. Two new aircraft now in flight test are the ALH of Hindustan Aeronautics and the MH-2000 of Mitsubishi Heavy Industries. Both entries are in the intermediate twin turbine class and were designed and built by experienced helicopter builders who have never before developed their own designs independent of collaboration with established Western manufacturers.

Also of particular interest to the FAA and the North American helicopter community are two new major development projects for commercial rotorcraft--the Sikorsky S-92 and the Bell-Boeing 609. Both aircraft could enter the market soon after the turn of the century.

The Sikorsky S-92, a 19-passenger transport, is based, in large part, on components of the military H-60 Black Hawk. Its primary market is expected to be the offshore oil service market, where many of the longer-range helicopters are aging and may soon be subject to operating constraints (under JAROPS-3) that will further weaken their economics. Additional sales prospects may exist in air taxi and priority freight service. Keys to the success of the S-92 will be its cost effectiveness and productivity, which prospective customers have identified as their greatest needs in increasingly elastic markets for their services. Its success will also turn on the company's strategy of integrating a number of international partners to share the risks and facilitate entry into overseas markets.

The Bell-Boeing 609 (formerly identified by the concept designation D-600) is a 9-passenger tilt-rotor aircraft. Bell and Boeing, with significant experience in tilt-rotor technology and operations, have targeted niche markets for the BB-609 rotorcraft that are now served by both helicopters and small fixed-wing aircraft, frequently in combination. In the course of Bell-Boeing's market research, some operators of corporate helicopters and fixed-wing turboprops raised the possibility of replacing both with an appropriate tilt-rotor for certain applications. Interest was also reported in the aeromedical and offshore service markets, both of which use a combination of fixed-wing and rotary-wing aircraft for many missions.

While the corporate market is less price sensitive than others, the BB-609, like the S-92, will have to achieve its target economics to succeed. At the same time, military applications for both of these civil designs are not unlikely, and any domestic or international military interest would certainly improve the viability of these programs. In any case, certification and introduction of these rotorcraft early in the next decade would impact the forecast both qualitatively, as older aircraft are replaced and quantitatively, since their economics and performance would tend to stimulate demand.

CIVIL TILT-ROTOR DEVELOPMENT ADVISORY COMMITTEE

In 1992, Congress directed the Secretary of Transportation to establish a Civil Tilt-rotor Development Advisory Committee to examine:

- the costs, technical feasibility, and economic viability of developing a civil tilt-rotor aircraft;
- the integration of tilt-rotors into the national transportation system; and
- the resulting economic benefit.

The committee was charged with determining the research and development and regulatory changes needed to integrate tilt-rotors into the transportation system. In addition, the committee was charged with investigating how aircraft research and infrastructure development costs should be allocated between Government and industry.

The committee found that the civil tilt-rotor is technically feasible and can be developed by U.S. industry, but additional research and development and infrastructure planning are needed before the industry can make a production decision. Successful tilt-rotor introduction depends on overcoming specific uncertainties and risks. Decisions to manufacturer the tilt-rotor, develop air and ground infrastructure, and operate services are interdependent, with no one party controlling all resources necessary to develop the tilt-rotor system. Vertiport siting is a critical factor for system viability. Planning for tilt-rotor infrastructure development should be integrated into national and local transportation system planning.

Under certain assumptions, a tilt-rotor system could be economically viable and operate profitably without government subsidies in heavily traveled corridors. The aircraft could attract a significant number of travelers willing to pay more for reduced overall trip time and greater convenience. The last finding was that the civil tilt-rotor could produce significant societal benefits. The benefits include reducing airport congestion, creating jobs, and having a positive impact on the balance of trade.

HELICOPTER FORECASTS

The forecasts of the rotorcraft fleet and flight hours discussed in this section are presented in tabular form in Table 27 in Chapter IX. Many of the assumptions used to develop the forecasts were derived from discussions with the helicopter industry experts invited to participate on the Vertical Flight Panel at the Transportation Research Board's (TRB) 9th International Workshop on Future Aviation Activities in September 1995. The assumptions and forecasts were further refined by informal consultations with the panel members in 1996.

ACTIVE FLEET

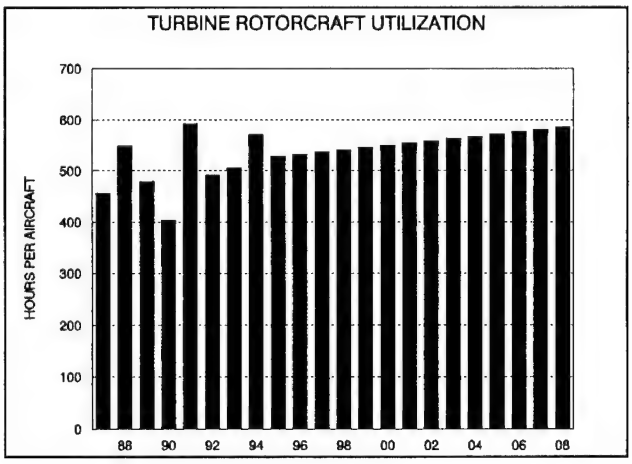
The active rotorcraft fleet is expected to total 4,800 in 2008. Compared to the 5,117 active aircraft in 1996, this represents an average annual decline of 0.5 percent in the active rotorcraft fleet during the forecast period.

The small decrease in the size of the active fleet is expected to occur primarily in the piston powered rotorcraft. That portion of the rotorcraft fleet is expected to decline from 1,474 in 1996 to 1,200 in 2008, an average annual decline of 1.7 percent.

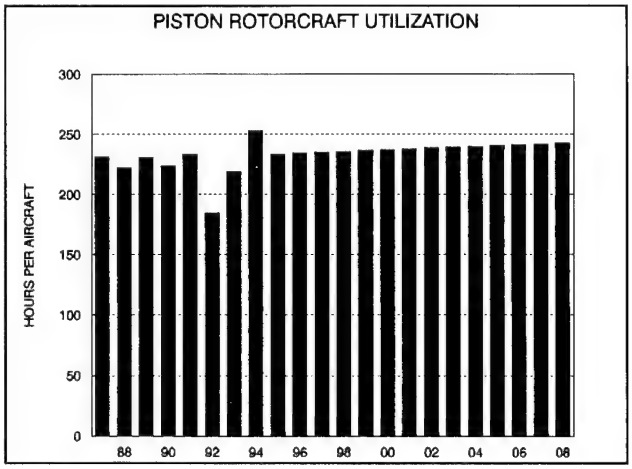
The number of turbine powered rotorcraft is expected to total 3,600 by 2008. This is virtually unchanged from 1996 and assumes that new units will equal attrition. Because of the decrease in the number of piston powered rotorcraft, turbine powered rotorcraft are expected to account for 75.0 percent of the rotorcraft fleet in 2008, up from 71.2 percent in 1996.

UTILIZATION

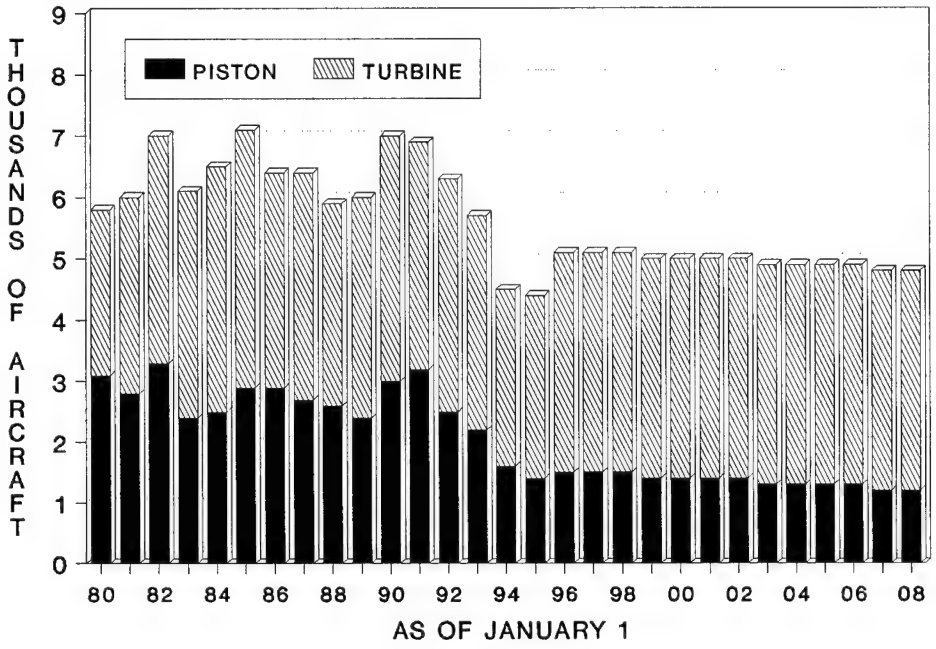
The annual utilization rate for the turbine powered helicopters is expected to increase from 532.3 hours in 1996 to 585.7 hours in 2008, an average annual increase of 0.8 percent. The rising cost pressures of owning a turbine helicopter that is not used in the optimum manner, along with increasing professionalism in the management of commercial helicopter operations, will cause owners/operators to use their helicopters more each year.



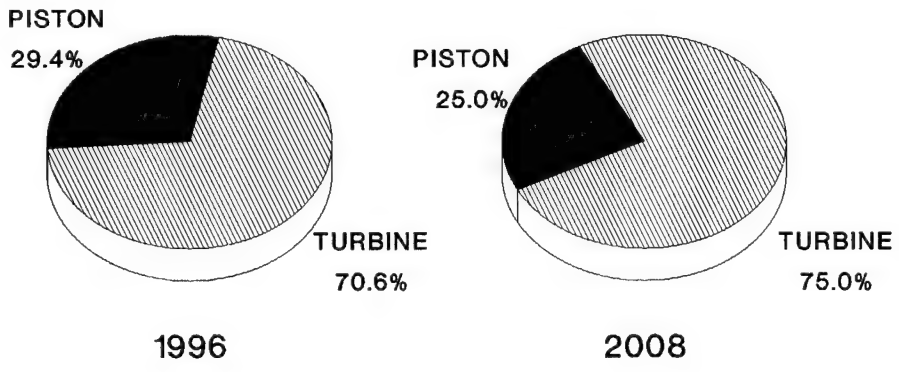
Average annual hours for the piston fleet are expected to increase slowly from 234.4 hours in 1996 to 243.0 hours in 2008.



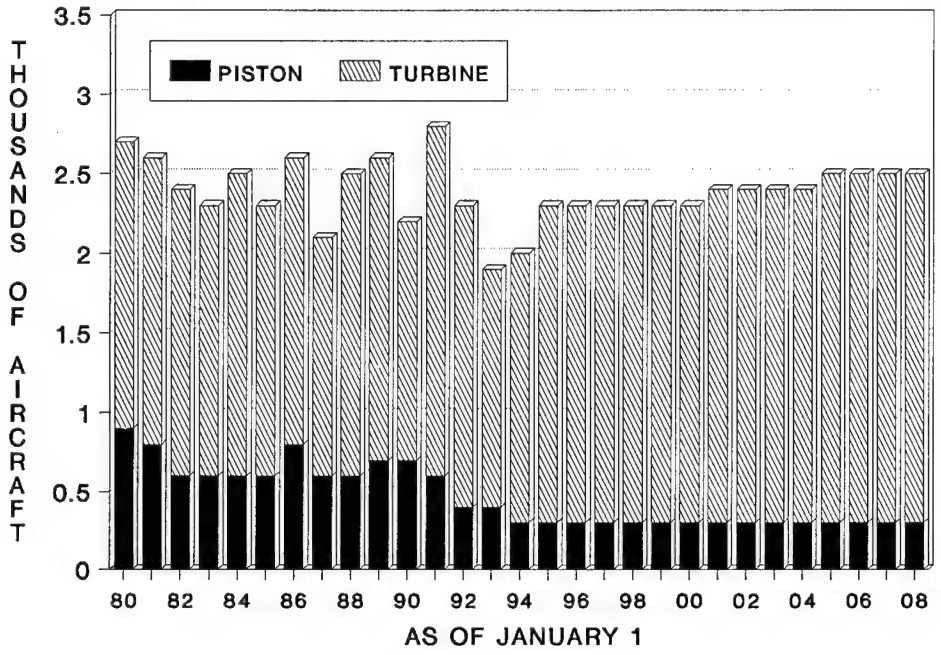
ACTIVE ROTORCRAFT



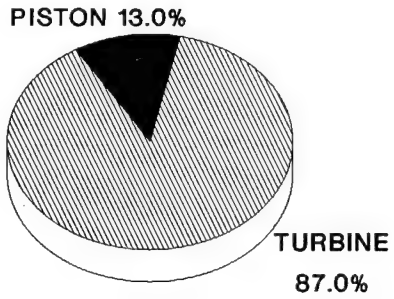
PERCENT BY AIRCRAFT TYPE



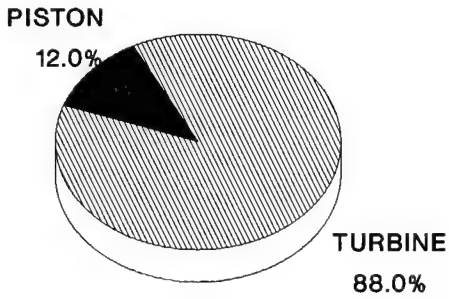
ROTORCRAFT HOURS FLOWN



PERCENT BY AIRCRAFT TYPE



1996



2008

FLIGHT HOURS

Although the active fleet is expected to decline, the utilization rates of these aircraft are projected to increase. Flight hours are expected to increase from 2.3 million in 1996 to 2.5 million in 2007. This represents an average annual growth rate of 0.7 percent.

The growth in the flight hours will occur totally in turbine powered rotorcraft. These hours are projected to increase by approximately 10 percent during the forecast period, reaching 2.2 million by 2008. This represents an average annual growth rate of 0.8 percent over the 12-year forecast period.

Flight hours for the piston powered portion of the rotorcraft fleet are expected to remain constant at 300,000 hours throughout the forecast period. The decrease in the number of piston powered helicopters and the projected stability in flight hours over the forecast period reflects an increasing level of utilization of the piston powered portion of the rotorcraft fleet.

FUEL CONSUMED

In 1996, fuel consumption by rotorcraft was estimated to have totaled 64.7 million gallons. Piston powered helicopters consumed 5.2 million gallons, while turbine powered helicopters consumed 59.5 million gallons. By 2008, fuel consumption by rotorcraft is projected to total 67.2 million gallons, 3.9 percent higher than the 1996 level. This represents an average annual growth in fuel consumed of 0.3 percent during the forecast period. The growth in rotorcraft fuel consumption is expected to come totally from the growth in use of turbine powered helicopters. Fuel consumed by turbine powered helicopters is forecast to reach 62.0 million gallons by 2008, an average annual growth rate of 0.3 percent. Fuel consumed by piston powered helicopters is expected to remain constant at 5.2 million gallons during the forecast period.

CHAPTER VII

FAA WORKLOAD MEASURES

CHAPTER VII

FAA WORKLOAD MEASURES

The FAA provides the aviation community with three distinct air traffic services: (1) air traffic control tower service at selected airports (315 FAA towers and 128 contract towers) as of September 30, 1996); (2) traffic surveillance and aircraft separation by air route traffic control centers(ARTCC) (22 in FY 1996); and (3) flight planning and pilot briefings at flight service stations (92 in FY 1996). All four aviation system user groups--air carriers, commuter/air taxi, general aviation, and military--use these FAA operational services to enhance the flow and safety of aviation traffic.

Because the four aviation system user groups differ in the demands they impose on the air traffic system, multiple indicators are used to describe the total FAA operational workload. No single measure typifies past trends or future demand for the services provided by the FAA.

For the remainder of this chapter, all specified years are fiscal years (October 1 through September 30), unless designated otherwise.

REVIEW OF 1996

During 1995 and 1996, a total of 87 FAA towered airports were converted to contract tower status. The removal of the airports from FAA air traffic counts makes comparisons to previous year's activity levels difficult, if not impossible. To overcome these discontinuities, the FAA is reporting air traffic activity at FAA and contract tower facilities on both an individual as well as a combined basis. Activity at FAA air route traffic control centers is not affected by the tower conversions.

TOWER ACTIVITY

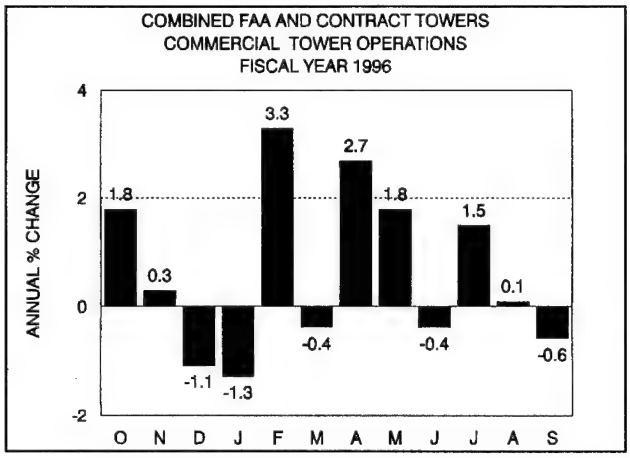
Combined FAA and Contract Towers

Aircraft activity at the 443 FAA and contract tower airports totaled 61.8 million operations in 1996, down 0.9 percent from 1995. Last year's unusually severe winter was probably responsible for some part of the decline. During the last decade (1986 to 1996), towered airport

activity has registered increases in all but 3 years.

The level of activity recorded at all towered airports in 1996 remains 3.4 percent below the operation counts recorded (64.0 million) during the 12-month period immediately preceding the August 1981 air traffic controllers' strike (hereafter referred to as the pre-strike period).

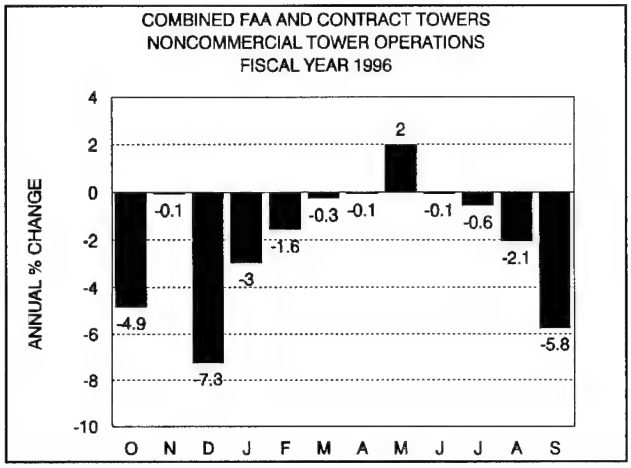
Since 1982, there has been strong demand by commercial aviation services. Commercial activity (the sum of air carrier and commuter/air taxi operations) is up 70.9 percent (3.9 percent annually) since 1982.



Commercial activity increased 0.6 percent in 1996, based on continued growth in air carrier activity. Air carrier operations at towered airports (13.9 million operations) increased 1.8 percent. The increase was, in part, due to the expansion of activity in the short-haul markets.

Commuter/air taxi activity declined in 1996. During the past decade, commuter/air taxi activity at towered airports has grown at an average annual rate of 3.9 percent, from 6.9 million operations in 1986 to 10.1 million in 1996. Much of the growth in past years is the result of commuter code-sharing and schedule tie-in agreements with the larger commercial air carriers. In addition, growth in recent years has also come from air carrier restructuring, and the giving up of low density, short-haul markets to commuters.

Noncommercial activity (the sum of general aviation and military operations), on the other hand, has declined 0.5 percent annually during the past decade. In 1996, noncommercial activity totaled 37.8 million operations, down 2.1 percent from 1995 activity.

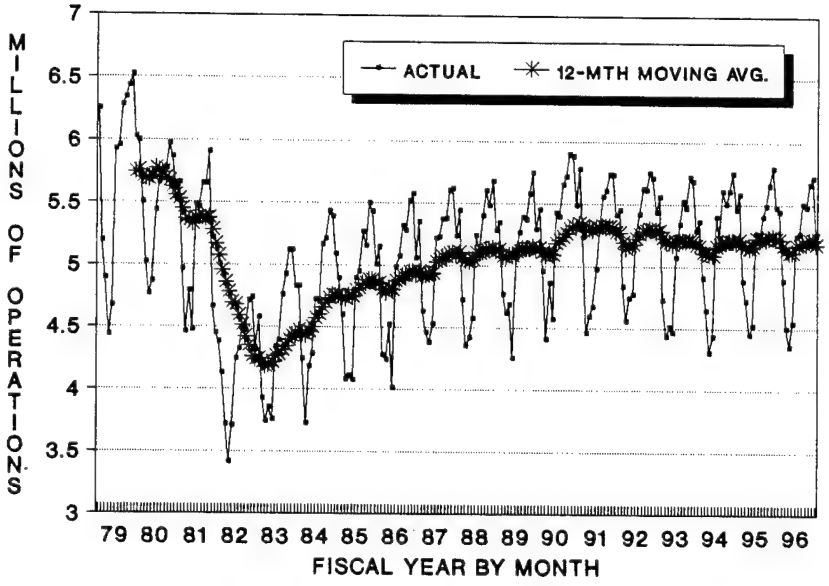


After recording increased activity counts in 6 of the 9 years following the 1981 air traffic controllers' strike, general aviation activity has declined for the past six consecutive years. General aviation activity totaled 35.2 million operations in 1996, a 9.3 percent decline from 1991. In fact, the 1996 operations count was only 74.7 percent of general aviation's pre-strike level of 47.1 million operations.

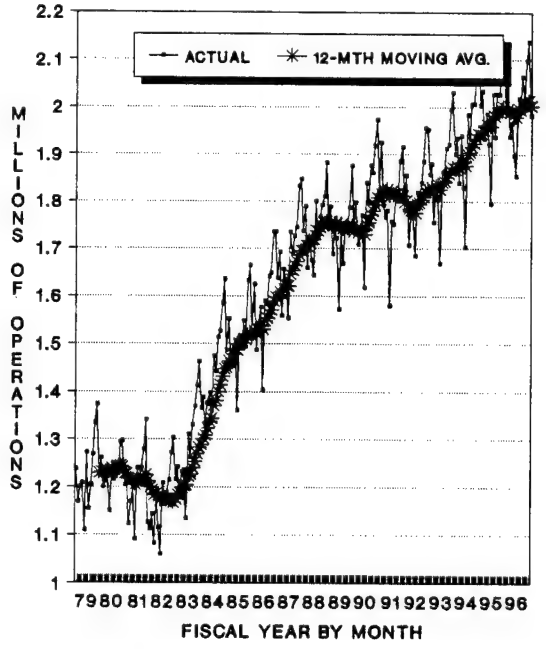
After increasing by 5.7 percent during the 1989-90 time period, the number of local general aviation operations has declined 13.3 percent during the past 6 years (down 4.6 percent in 1996), reflecting, in part, the continuing decline in student training. Itinerant general aviation operations declined by 0.5 percent in 1996 to 20.8 million. Itinerant operations in 1996 were at 75.6 percent of pre-strike activity levels (27.5 million), while local operations were at 74.6 percent of the pre-strike level (19.3 million).

COMBINED FAA AND CONTRACT TOWERS
TOWERED AIRPORT OPERATIONS

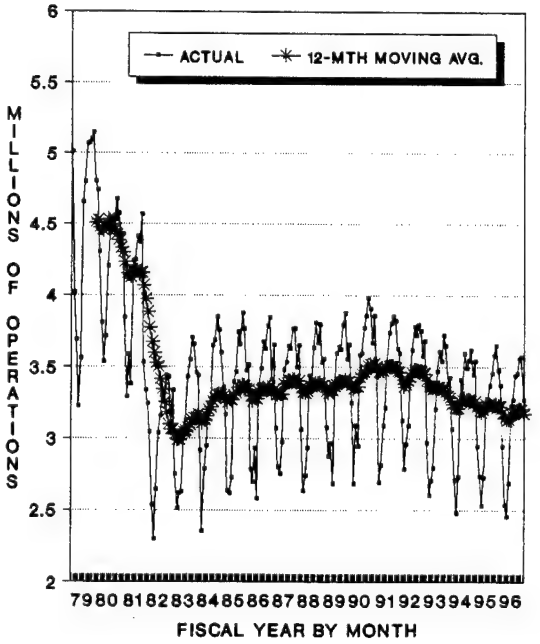
TOTAL OPERATIONS



COMMERCIAL OPERATIONS



NONCOMMERCIAL OPERATIONS



Military operations totaled 2.6 million in 1996. Local and itinerant military operations showed no change in 1996 at 1.3 million.

FAA Towers

On September 30, 1996, the number of FAA towers totaled 315, down from 352 in 1995. During 1996, 37 FAA towers were converted to contract towers. It is important to note that the decline in FAA tower activity in 1996 reflects, in large part, the reduction in the number of FAA towers.

Aircraft activity at the 315 FAA towered airports totaled 54.4 million operations in 1996, down 6.2 percent from 1995. Commercial activity declined 1.3 percent, while noncommercial activity dropped 9.5 percent.

In 1996, air carrier activity at FAA towers increased 1.2 percent, while commuter/air taxi, general aviation, and military operations declined 5.4, 9.4, and 9.2 percent, respectively

Contract Towers

On September 30, 1996, the number of contract towers totaled 128, a net increase of 34 towers from 1995. During 1996, 37 FAA towers were converted to contract towers, and FAA support for 3 contract towers was terminated.

Aircraft activity at the 128 contract tower airports totaled 7.4 million operations in 1996, up 67.7 percent from 1995. Commercial activity increased 110.1 percent, while noncommercial activity expanded 62.7 percent.

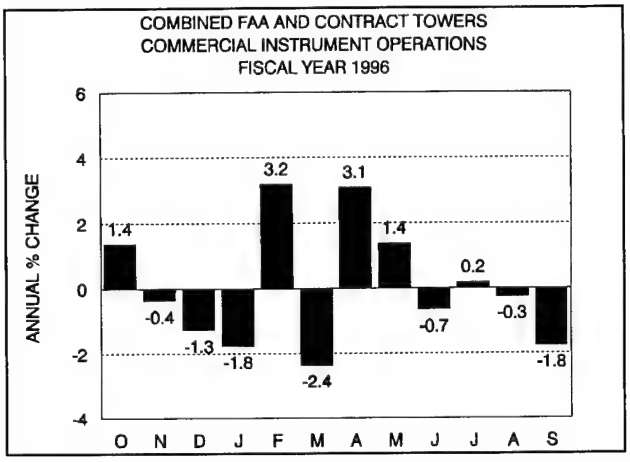
In 1996 air carrier activity at contract towers increased 125.8 percent, while commuter/air taxi, general aviation, and military operations increased 107.9, 63.9, and 47.6 percent, respectively.

Operations counts for the 315 FAA towered airports and the 128 contract towers, by user group, can be found in the publication *FAA Air Traffic Activity FY 1996*, compiled by the Information and Systems Branch, Office of Aviation Policy and Plans, phone (202) 267-9942.

INSTRUMENT OPERATIONS

Combined FAA and Contract Towers

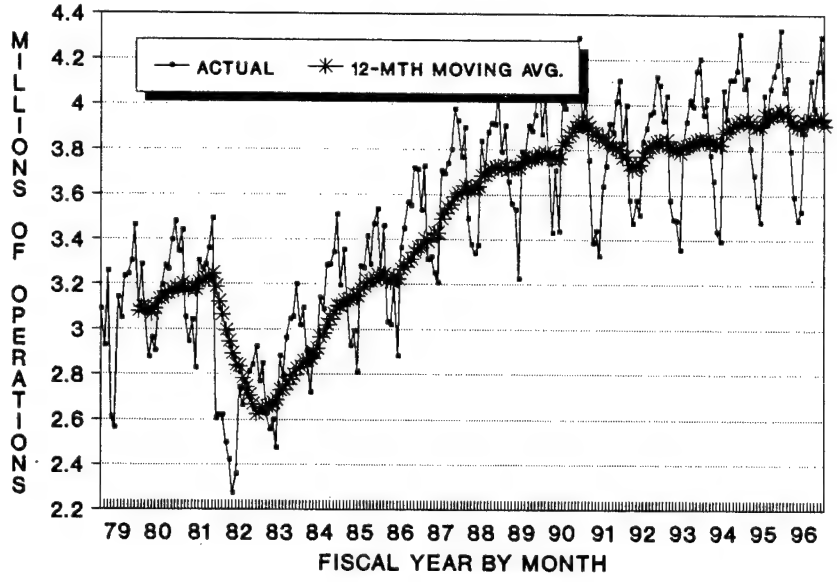
Instrument operations handled at combined FAA and contract towers totaled 46.8 million in 1996, down 1.2 percent from the 1995 activity level. In 1996, FAA towers accounted for over 98.7 percent of combined total instrument operations.



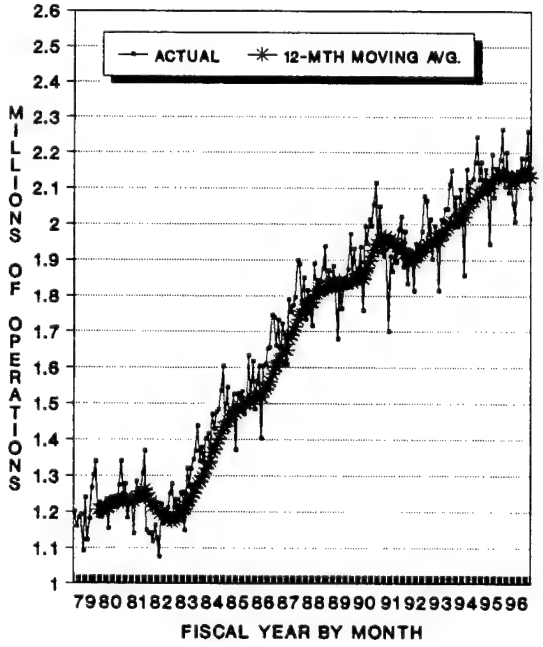
Commercial aircraft activity (25.6 million operations) remained unchanged from 1995. Air carrier instrument operations totaled 14.8 million, up 0.7 percent. Air carrier instrument operations during the past 4 years have shown strong growth, up 8.8 percent. Commuter/air taxi instrument operations totaled 10.8 mil-

COMBINED FAA AND CONTRACT TOWERS
INSTRUMENT OPERATIONS

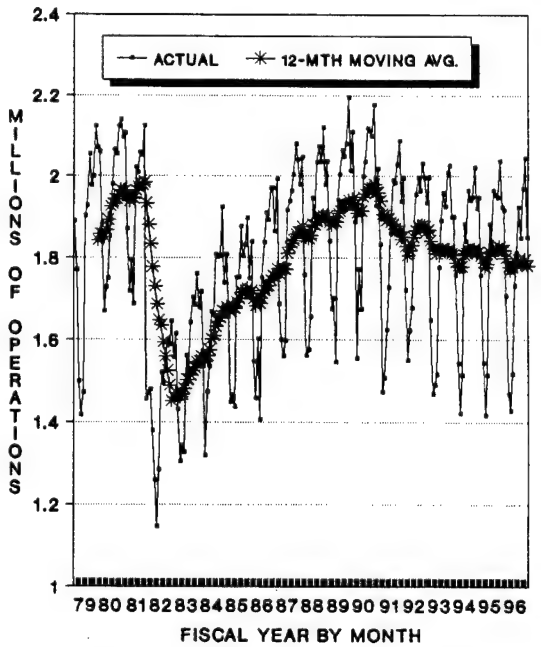
TOTAL OPERATIONS



COMMERCIAL OPERATIONS

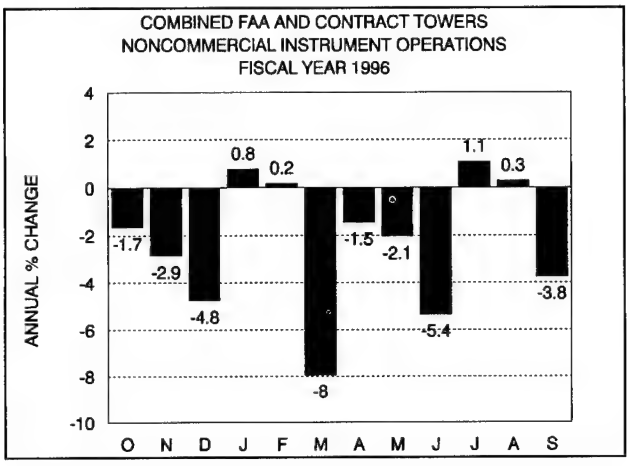


NONCOMMERCIAL OPERATIONS



lion in 1996, down 0.9 percent from the 1995 activity level.

Noncommercial instrument operations (21.2 million) decreased 2.6 percent in 1996. General aviation activity totaled 17.9 million, a decline of 1.7 percent from 1995.



Most of the increase in general aviation activity since 1982--over 50 percent--can be attributed to the formation of radar service areas at 150 locations throughout the United States. Currently, there are 29 Class B (Terminal Control Areas) and 121 Class C (Airport Radar Service Areas).

Military instrument operations totaled 3.3 million in 1996, down 7.1 percent from 1995 operation counts.

FAA Towers

Changes in FAA tower activity in 1996 reflect, in part, the significant reduction in the number of FAA Level I VFR towers in 1996. However, the overall impact on instrument operations is relatively minor. Most of the contracted towers' instrument operations are handled by and included in FAA's radar facilities' operations counts.

Instrument operations at the 315 FAA towered airports totaled 46.2 million in 1996, a decline of 1.7 percent from 1995. Commercial activity fell 0.4 percent, while noncommercial activity dropped 2.8 percent.

In 1996, air carrier instrument operations at FAA towers increased 0.3 percent. Commuter/air taxi, general aviation activity, and military operations declined 1.7, 2.1, and 7.5 percent, respectively.

Contract Towers

Instrument operations at the 128 FAA contract towered airports totaled 559,000 in 1996, up 64.6 percent from 1995. Commercial activity increased 74.0 percent, while noncommercial activity increased 52.6 percent.

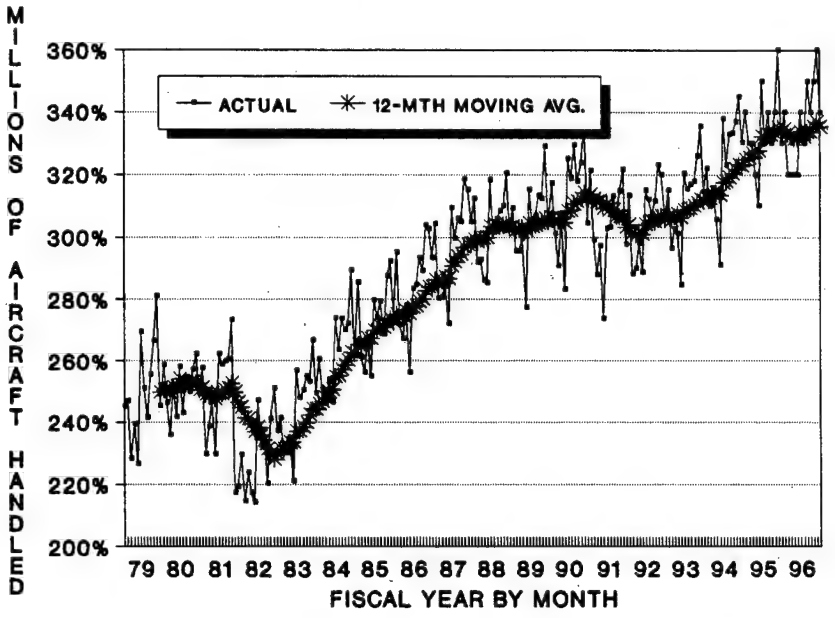
In 1996, air carrier instrument operations at FAA contract towers increased 205.6 percent, while commuter/air taxi, general aviation, and military operations increased 52.3, 52.6, and 52.5 percent, respectively.

CENTER ACTIVITY

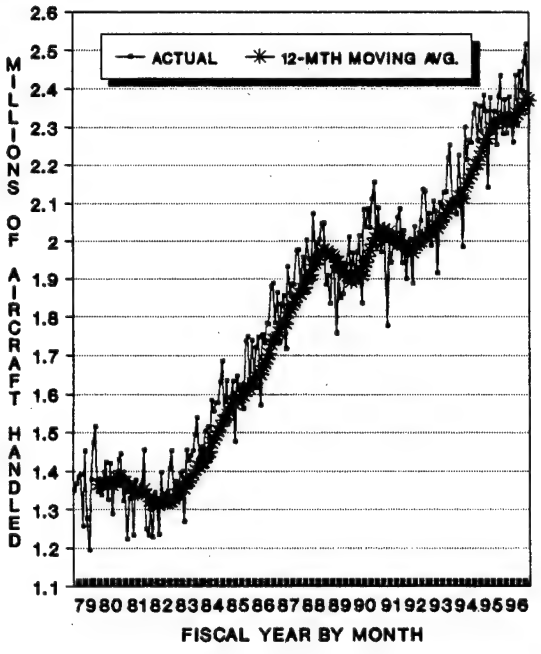
In 1996, the number of aircraft flying under instrument rules handled by FAA air route traffic control centers totaled 40.3 million, an increase of 0.7 percent over 1995 activity counts. The increase at en route centers in the last 5 years (up 11.6 percent) can be attributed to the growth in commercial aviation activity (up 20.3 percent). The number of commercial aircraft handled at the centers (28.5 million) increased 2.4 percent in 1996. The number of air carrier aircraft handled totaled 21.9 million (up 4.5 percent), while the number of commuter/air taxi aircraft handled totaled 6.6 million (down 4.1 percent). (*In 1996, due to an accounting change at the New York ARTCC, approximately*

IFR AIRCRAFT HANDLED

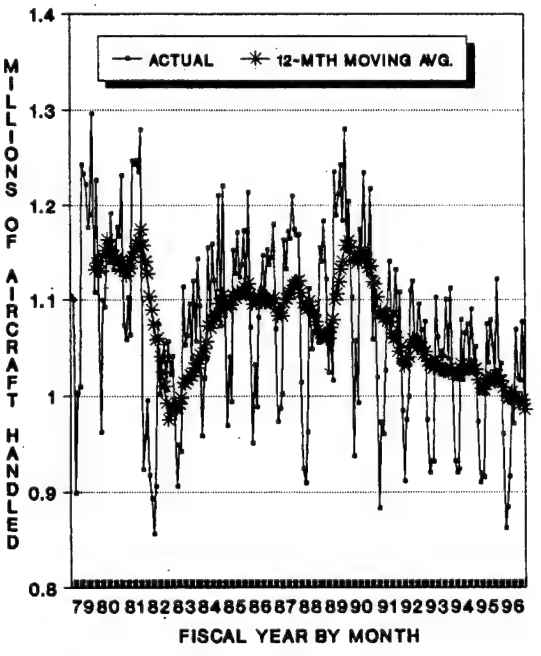
TOTAL AIRCRAFT HANDLED



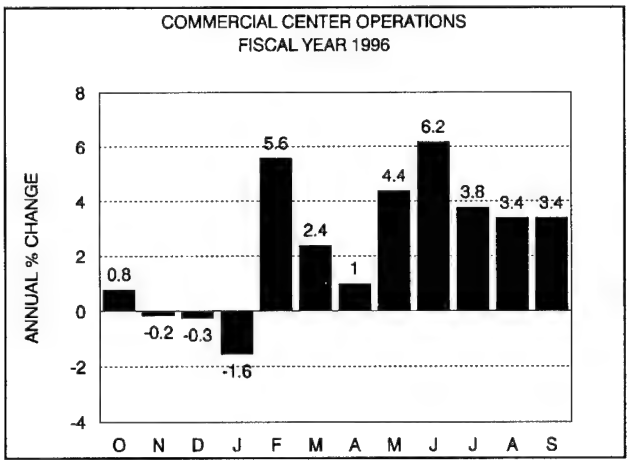
COMMERCIAL AIRCRAFT HANDLED



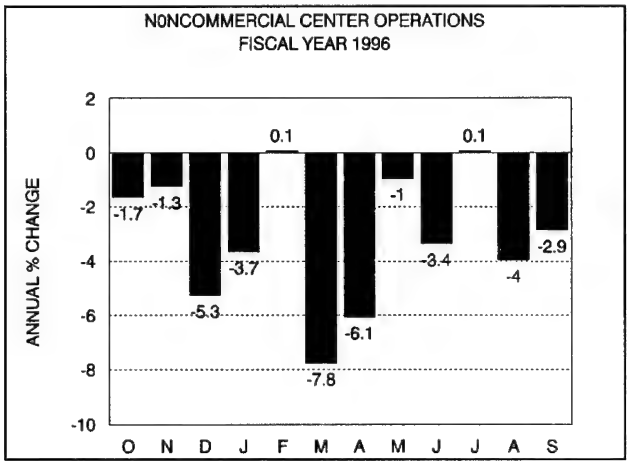
NONCOMMERCIAL AIRCRAFT HANDLED



360,000 operations were shifted from the commuter/air taxi category to air carrier).



The number of noncommercial aircraft handled (11.8 million) was down 3.3 percent in 1996. The number of general aviation aircraft handled totaled 7.8 million (up 0.5 percent), while military activity totaled 4.0 million (down 9.6 percent). The military declines experienced over the past 4 years (down 21.6 percent) appear to be the result of a general cutback in overall military activity levels.

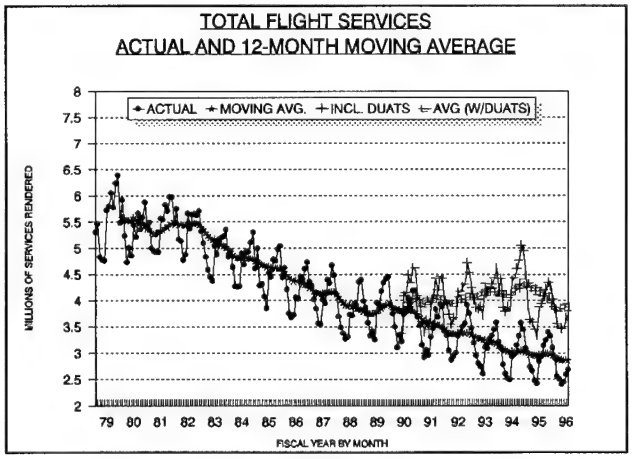


FLIGHT SERVICE STATION ACTIVITY

Pilot briefings, flight plans filed, and aircraft contacts recorded by flight service stations (FSSs) totaled 33.4 million in 1996, a decline of 5.1 percent from 1995 activity levels. Activity declined in two of the three flight service categories. The number of aircraft contacted dropped 9.5 percent to 3.8 million, the number of pilot briefings declined 8.7 percent to 8.4 million, and the number of flight plans originated increased 1.6 percent to 6.4 million.

However, the FAA also provides automated flight services, which supplement FSS activity. The Direct User Access Terminal System (DUATS) provides an alternative to the FSS for obtaining pilot briefing information and filing flight plans. Use of this service was introduced in February 1990. In 1996, the number of flight plans filed through DUATS increased 12.5 percent When the services provided through DUATS are included with traditional FSS services, total flight plans filed increased from 7.1 million in 1995 to 7.3 million in 1996.

The number of DUAT transactions increased 5.3 percent in 1996, from 4.9 million in 1995 to 5.1 million.



Thus, the total flight services provided by the FAA in 1996 decreased only 2.6 percent compared to 1995.

On September 30, 1996, there were a total of 61 automated flight service stations (AFSSs) and 30 flight service stations.

FORECAST ASSUMPTIONS

Forecast growth in FAA workload measures includes not only the demand imposed on the existing National Airspace System, but also aviation activity at new locations not previously provided with FAA services. Workload forecasts are presented for combined FAA and contract towers, and separately for FAA facilities and contract towers.

NUMBER OF FAA FACILITIES

In 1996 there were 315 FAA towered airports. During the next two years, under the agency's tower conversion plan, 40 FAA Level 1 VFR towered airports are scheduled to become FAA contracted towers--25 in 1997 and 15 in 1998. There are 150 radar service areas--29 Class B and 121 Class C.

The number of flight service stations (FSS) and automated flight service stations (AFSS) totaled 91 on September 30, 1996: 61 AFSSs and 30 FSSs. Of the remaining FSSs, 14 are Alaskan rotational FSSs and 16 are auxiliary FSSs. However, the 16 auxiliary FSSs in the contiguous 48 States will be closed by the end of. 1997.

EXTERNAL FACTORS

Despite projections of moderate to strong growth in the U. S. economy and in activity levels at FAA facilities, there is uncertainty associated with these forecasts. A number of external events could significantly alter the short-term environment and cause the activity levels to be significantly different than those forecasted.

In 1996, lower air fares, heightened consumer confidence, and strong economic growth in the United States and abroad have continued to expand air travel. Although we expect these favorable economic factors to have a continuing positive effect on aviation over the next several years, deviations from these trends could alter the forecasts presented in this document.

The significant growth in low-cost service is moving the major carriers to restructure and reduce unit costs. If the airlines can achieve their goals, all other things being equal, fares should continue to fall. In effect, competition should push all fares to the marginal costs of the most efficient firms in the industry. In addition, new-entrant low-cost carriers are expected to continue to expand their share of the market and intensify competition.

All of the assumptions cited above should increase air carrier activity at FAA facilities during the next several years. Clearly, changes in these assumptions concerning the industry will cause deviations from the expected outcomes. For example, if relatively high-cost airlines cannot achieve their cost and productivity goals, they may be forced to reduce operations or leave the industry. Under this scenario, growth in activity at FAA facilities could be slowed.

Other additional factors to be considered are the impact of the phase-out of air carrier stage-2 aircraft on regional/commuter carriers' activity levels, the move of the regional/commuter carriers to larger turboprop and jet aircraft, and

the new commuter rule. As stage-2 aircraft are phased out of the air carrier fleet, it is expected that some of the larger carriers may elect to transfer the routes formerly served by these aircraft to their code-sharing partners who generally provide service with smaller capacity turboprop aircraft. Should the number of route transfers greatly exceed current expectations, regional/commuter operations at FAA air traffic facilities could be higher than currently forecast. Conversely, air carrier operations would be lower. Further, the new commuter rule could reduce commuter operations below current projections, while the move to more sophisticated aircraft by the regional/commuter carriers could intensify their use of the air traffic control system.

WORKLOAD FORECASTS

During 1997 and 1998, 40 FAA towers are scheduled for conversion to contract tower status--25 in 1997 and 15 in 1998. For developing the forecasts, the following assumptions were made: 1) the distribution of the conversions throughout both years is uniform; and 2) 25 towers are removed from the system by the end of 1997 and all 40 FAA towers are removed from the system by the end of 1998. The tower conversions cited above will not impact air route traffic control centers.

METHODOLOGY

To forecast the level of FAA tower activity over the 12-year planning period, the following methodology was used. First, separate forecasts were prepared for operations at the 275 towered airports (the number of towered airports at the end of 1998), the current 128 contract towers, and the 40 towers scheduled to be converted to contract status by the end of 1998. Second, for 1997, 75 percent of the operations for the 40 airports were added to the operations of the 275 towered airports, since it is assumed that the conversions are uniformly distributed throughout the 2 years. For 1998, 30 percent of the operations of the 40 airports were added. By the end of 1998, all 40 towers are removed from the system. Forecasts for 1997, 1998, and for the remaining forecast years reflect, in part, the reduction in the number of FAA towers from 315 in 1996 to 275 in 1998.

A similar approach was used to estimate operations for contract towers. Only 25 percent of the operations of the 40 towers were counted in 1997 and added to the expected number of operations for the current 128 contract towers; 75 percent of the operations were added in 1998. By the end of 1998, all expected conversions are completed. Forecasts of operations at contract towers for 1997, 1998, and for the remainder of the forecast planning horizon reflect, in part, an increase in the number of contract towers from 128 in 1996 to 168 in 1998.

TOWER ACTIVITY

Combined FAA and Contract Towers

Operations at combined FAA and contract towered airports are forecast to increase by 1.4 percent in 1997 and 1.1 percent in 1998. The slower growth during the next two years is largely due to the expected declines in military activity during this period--down 2.0 percent in 1997 and 4.0 percent in 1998. On the other hand, air carrier activity is expected to increase by 3.0 percent in 1997, the relatively large increase due to the continued expansion in the U.S. economy (GDP up 2.4 percent) and the

expansion of commercial activity in short-haul markets. During the 12-year forecast period, operations at FAA and contract towered airports are projected to increase by 1.3 percent annually. In absolute numbers, these combined towered operations are projected to total 72.3 million in 2008.

The mix of aircraft using combined FAA and contract towered airports is expected to change, as the total of general aviation and commuter/air taxi operations (i.e., operations performed by smaller aircraft) is expected to grow by about 13.2, percent while the number of air carrier operations is expected to increase 33.8 percent.

The combined activities of general aviation and commuter/air taxi are expected to account for 71.0 percent of total tower operations in 2008, down from a 73.3 percent share in 1996. Air carrier operations share of the combined towered airport activity is expected to increase during the forecast period, from 22.5 percent in 1996 to 25.7 percent in 2008.

Commuter/air taxi activity has historically exceeded that of the larger commercial air carriers. However, with the expected move toward greater use of larger regional turboprops and turbojets, longer passenger trips, and higher load factors, commuter/air taxi activity is projected to grow at rates less than that forecast for the larger commercial air carriers.

The forecasted activity levels and average annual growth rates for each aviation user group from 1996 to 2008 are: commuter/air taxi, from 10.1 to 12.9 million operations (2.0 percent annual growth); air carrier, from 13.9 to 18.6 million operations (2.5 percent); and general aviation, from 35.2 to 38.4 million operations (0.7 percent).

Itinerant general aviation operations are forecast to increase from 20.8 to 22.7 million operations (9.1 percent over the period), and local general aviation operations from 14.4 to 15.7 million operations (9.0 percent over the period). Total military operations are expected to level off at 2.4 million operations in 1998 and to remain at this activity level throughout the remainder of the forecast period.

Commercial aircraft activity at these combined towered airports is expected to grow at an average annual rate of 2.3 percent during the 12-year forecast period, from 24.0 to 31.5 million. Noncommercial activity is forecast to increase from 37.8 million in 1996 to 40.8 million in 2008, an average annual increase of 0.6 percent.

FAA Towers

In 1996, operations at the 315 FAA towered airports totaled 54.4 million. However, during 1997 and 1998, 40 FAA towers are scheduled for conversion to contract towers, reducing the total number of FAA towered airports for the forecast period to 275.

For the 12-year forecast period, operations at FAA towered airports are forecast to increase 0.7 percent a year. In absolute numbers, towered operations are projected to total 59.3 million in 2008.

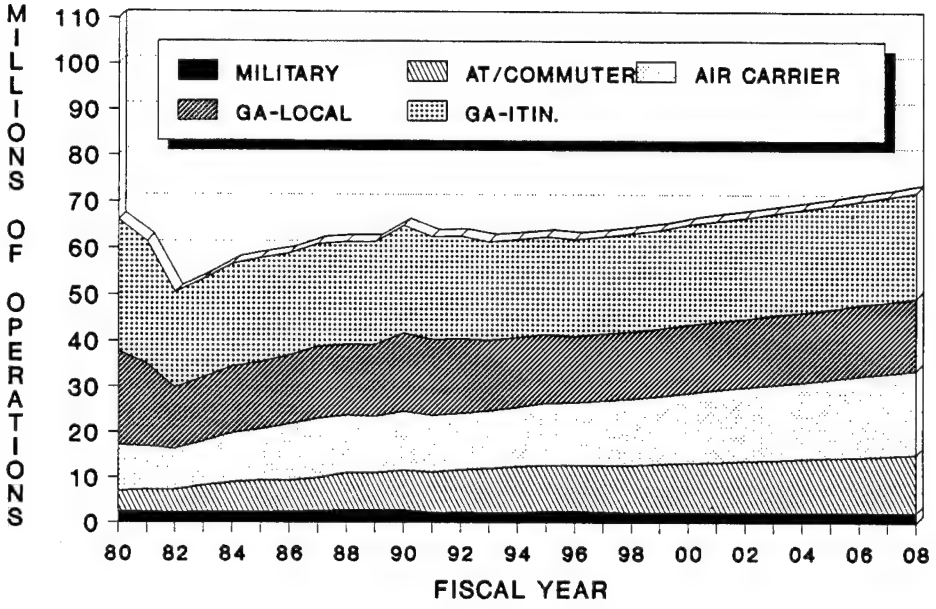
Commercial aircraft activity at FAA towered airports is expected to grow at an average annual rate of 2.1 percent during the 12-year forecast period, from 23.1 to 29.5 million.

Noncommercial activity is expected to decline from its current level of 31.3 million to 29.8 million in 2008.

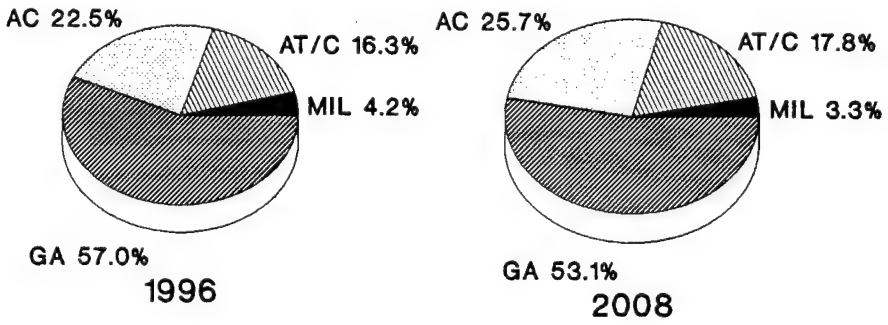
Contract Towers

In 1996, operations at the 128 contract towered airports totaled 7.4 million. During 1997 and 1998, the total number of contract airports will

AIRCRAFT OPERATIONS AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE



DISTRIBUTION OF WORKLOAD BY USER GROUP



increase by 40 to 168. The number of FAA contract towers will remain at this level through the forecast period.

For the 12-year forecast period, operations at contract towered airports are forecast to increase 4.8 percent a year. In absolute numbers, towered operations are projected to total 13.0 million in 2008. Commercial aircraft activity at contract towered airports is expected to grow at an average annual rate of 6.1 percent during the 12-year forecast period, from 983,700 to 2.0 million. Noncommercial activity is forecast to increase from 6.5 million in 1996 to 11.0 million in 2008, an average annual increase of 4.5 percent.

INSTRUMENT OPERATIONS

Combined FAA and Contract Towers

Combined FAA and contract tower instrument operations are forecast to grow by 1.3 percent in 1997 and 1.7 percent in 1998. During the forecast period, combined instrument operations are expected to increase at an average annual rate of 1.6 percent, growing from a total of 46.8 million operations in 1996 to 56.7 million operations in 2008. In 2008, FAA towers will account for about 98.2 percent of instrument operations, down about 0.5 percentage points from 1996.

The mix of instrument operations is expected to change during the forecast period. The number of commuter/air taxi and general aviation operations performed by smaller aircraft will increase at a much slower rate than the number of operations performed by the larger, more sophisticated air carrier aircraft (17.4 versus 34.5 percent). By 2008, 35.1 percent of all instrument operations are expected to be performed by air carrier aircraft, up from 31.6 percent in 1996. Commuter/air taxi and general aviation operations share of the total will drop from 61.3 percent in 1996, to 59.4 percent in 2008.

The projected activity levels and average annual growth rates for each user group from the year 1996 to 2008 are: commuter/air taxi, from 10.8 to 13.8 million operations (2.0 percent annually); air carrier, from 14.8 to 19.9 million operations (2.5 percent annually); and general aviation, from 17.9 to 19.9 million operations (0.9 percent annually). Military activity is expected to decline from 3.3 million in 1996 to 3.1 million in 1998, and then stay at this level for the remainder of the forecast period.

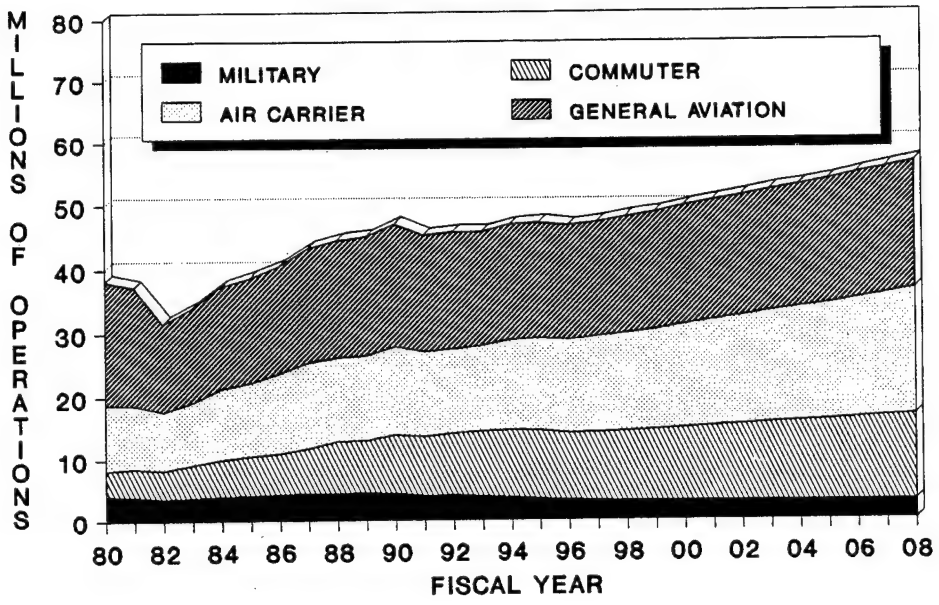
During the 12-year forecast period, commercial activity is expected to increase at an average rate of 2.3 percent annually, from 25.6 to 33.7 million. Noncommercial activity is forecast to increase from 21.2 million in 1996 to 23.0 million in 2008, an average annual growth rate of 0.7 percent.

FAA Towers

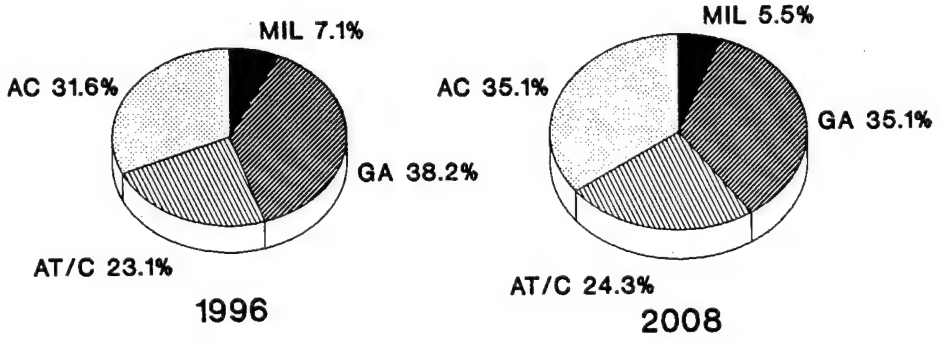
For the 12-year forecast period, instrument operations at FAA towered airports are forecast to increase 1.6 percent a year. In absolute numbers, FAA towered instrument operations are projected to total 55.7 million in 2008.

Commercial instrument operations at FAA towered airports are expected to grow at an average annual rate of 2.2 percent during the 12-year forecast period, from 25.3 to 33.0 million. Noncommercial activity is expected to increase from 21.0 million in 1996 to 22.7 million in 2008, up only 0.7 percent a year.

INSTRUMENT OPERATIONS AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE



DISTRIBUTION OF WORKLOAD BY USER GROUP



Contract Towers

For the 12-year forecast period, instrument operations at contract towered airports are forecast to increase 4.6 percent a year. In absolute numbers, contract towered operations are projected to total 961,000 in 2008.

Commercial instrument operations at contract towered airports are expected to grow at an average annual rate of 5.2 percent during the 12-year forecast period, from 330,600 to 609,000. Noncommercial activity is forecast to increase from 228,400 in 1996 to 352,000 in 2008, an average annual increase of 3.7 percent

CENTER ACTIVITY

The workload at FAA air route traffic control centers is expected to increase by 1.4 percent in 1997, 2.2 percent 1998, and 1.1 percent in 1999. During the 12-year forecast period, the number of aircraft handled at en route centers is forecast to increase 1.8 percent annually, from 40.3 million aircraft handled in 1996 to 50.2 million in 2008.

The commercial aircraft activities' share of center workload is forecast to increase from 70.7 percent in 1996 to 75.3 percent in 2008. Between 1996 and the year 2008, the air carrier share is forecast to increase from 54.3 percent to 58.2 percent. The commuter/air taxi share is expected to increase from 16.4 percent to 17.1 percent during the same time period.

The projected activity levels and average annual growth rates for each user group from 1996 to 2008 are: commuter/air taxi, from 6.6 to 8.6 million aircraft handled (2.2 percent annual growth); air carrier, from 21.9 to 29.2 million aircraft handled (2.4 percent annually); and general aviation, from 7.8 to 8.8 million aircraft handled (1.0 percent annually). The number of military operations is expected decline from 4.0 million in 1996 to 3.6 million in 1998, and remain at this level through 2008.

Commercial activity is expected to grow at an average annual rate of 2.4 percent during the forecast period, from 28.5 to 37.8 million. Noncommercial activity is forecast to increase 0.4 percent annually, from 11.8 million in 1996 to 12.4 million in 2008.

Forecasts for individual centers are available upon request from the Statistics and Forecast Branch, Office of Aviation Policy and Plans, (APO-110), phone (202) 267-3355.

FLIGHT SERVICE STATION ACTIVITY

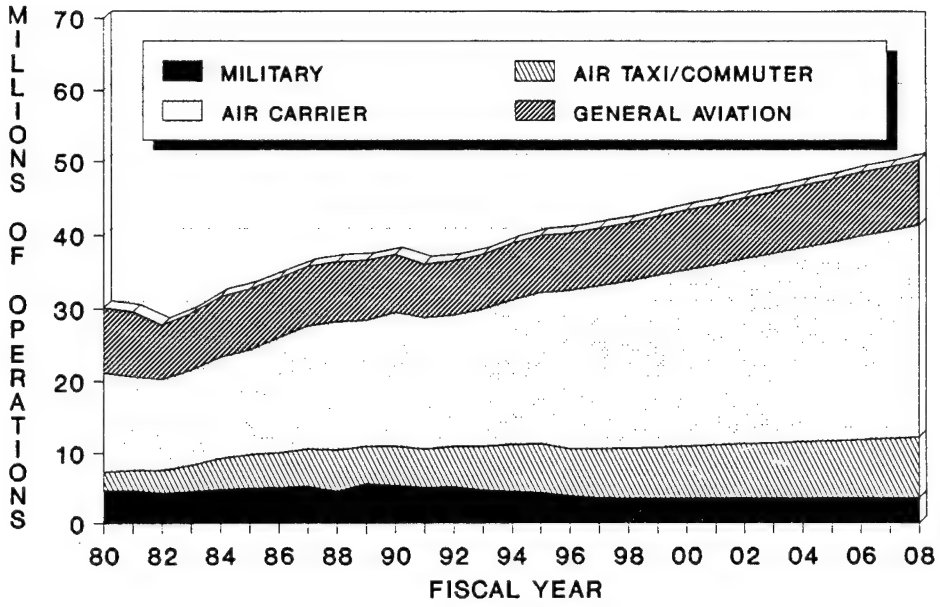
Total traditional (non-automated) flight services originating at FAA flight service stations are forecast to decline throughout the forecast period. In absolute numbers, the number of total flight services is expected to decline to 32.8 million (down 1.8 percent) in 1997, and to 32.0 million (down 2.4 percent) in 1998. By the end of the forecast period, total flight services provided by the FAA flight service stations are projected to total 30.0 million (an average annual decline of 0.9 percent).

Non-automated Service

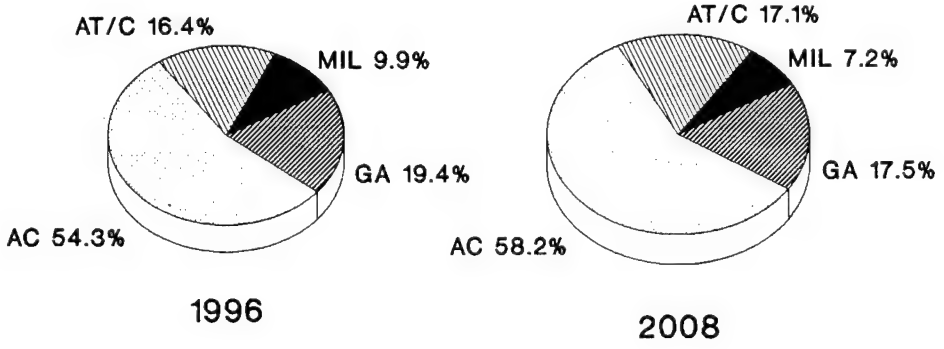
The number of pilot briefings is forecast to decline to 8.2 million (down 2.4 percent) in 1997, and 8.4 million (down 2.4 percent) in 1998. Again, pilot briefings are projected to continue to decline throughout the forecast period, declining to 7.6 million in 2008, an average annual rate of decline of 0.8 percent.

The number of flight plans originated is projected to remain unchanged at 6.4 million in

IFR AIRCRAFT HANDLED AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS



DISTRIBUTION OF WORKLOAD BY USER GROUP



1997, and then decline to 6.3 million in 1998 (down 1.6 percent). During the balance of the forecast period, flight plans originated through FAA flight service stations are also expected to continue to decline. By the year 2008, total flight plans originated are projected to be 5.9 million, a 0.7 percent average annual decline.

The number of aircraft contacted is forecast to decline to 3.6 million (down 5.3 percent) in 1997, and to 3.4 million (down 5.6 percent) in 1998. Thereafter, the number of aircraft contacted is expected to decline marginally to 3.0 million in 2008, a 2.0 percent average annual decline.

Flight Service Activity Data

The introduction of new technology for flight service applications has significantly changed the operating environment of the flight service system. Viewed in the larger context of the total National Airspace System, the recent workload trends do not necessarily indicate declining demand for flight planning services. Rather, they may indicate that demand is being met through increased use of automation and new system capabilities resulting in increased system efficiencies and productivity.

Specifically, several factors resulting from automation will tend to dampen the growth in FSS workload measures, as currently defined. First, pilots can now obtain weather briefings through the Telephone Information Briefing System (TIBS), which does not require contact with a flight service specialist, and is not, therefore, included in the FSS pilot briefings count. Second, private weather briefing vendors, participating in memorandums of agreement with the FAA, can also provide weather briefings and file flight plans for their customers without going through an FSS. Third, starting February 1990, DUATS became operational. Using DUATS, pilots with access to a computer, modem, and telephone can directly access a national weather data base for weather briefings and flight plan filing without ever going through an FSS.

This automated access may be through the pilot's own computer or through those of fixed-based operators offering the service to their customers. None of the flight planning services provided through the above sources are included in the FSS workload measures.

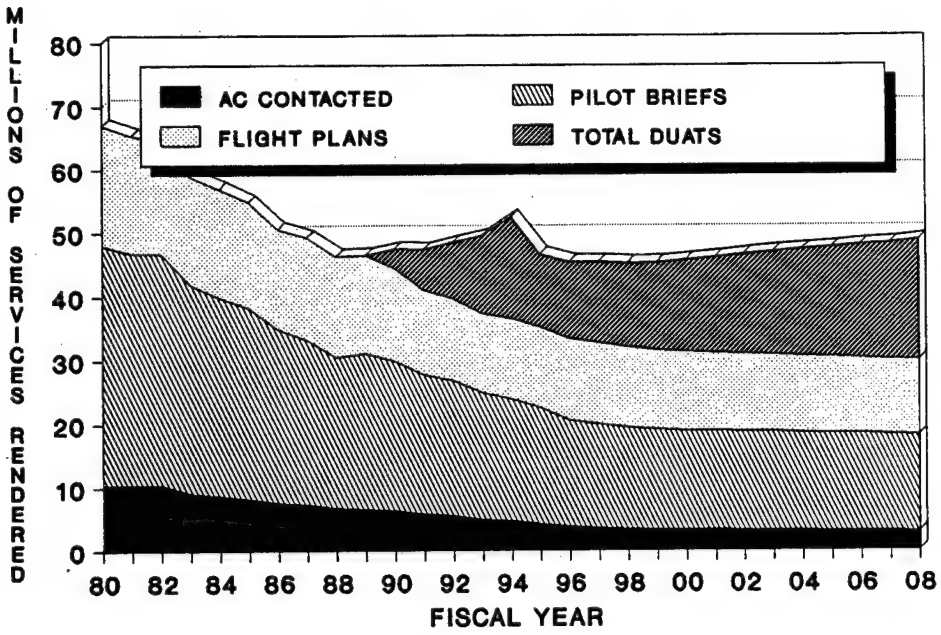
During 1996, there was a total of 5.1 million DUATS transactions, 4.1 percent higher than 1995. If each transaction involves a weather briefing, this represents 5.1 million pilot briefs. In addition, about 930,800 flight plans were filed through the DUATS system (up 10.8 per-cent). Using the weighted total flight services formula (two times the sum of pilot briefs and flight plans filed), this translates into approximately 12.0 million total flight services that are not included in the FAA flight service station workload measure.

DUATS transactions are projected to increase from 5.1 million in 1996 to 5.3 million in 1997. In 1998, DUATS transactions are projected to total 5.5 million, a 5.8 percent increase over the 1997 level. During the period 1996 through 2008, DUAT transactions are forecast to increase at an average annual rate of 3.0 percent, reaching 7.3 million in 2008. For the entire forecast period, flight plans filed through DUATS are expected to increase from approximately 930,800 to 2.1 million in 2008, a 7.3 percent average annual increase. By the year 2008, total services provided through DUATS are projected to account for 18.8 million flight services, or 38.5 percent of total system services.

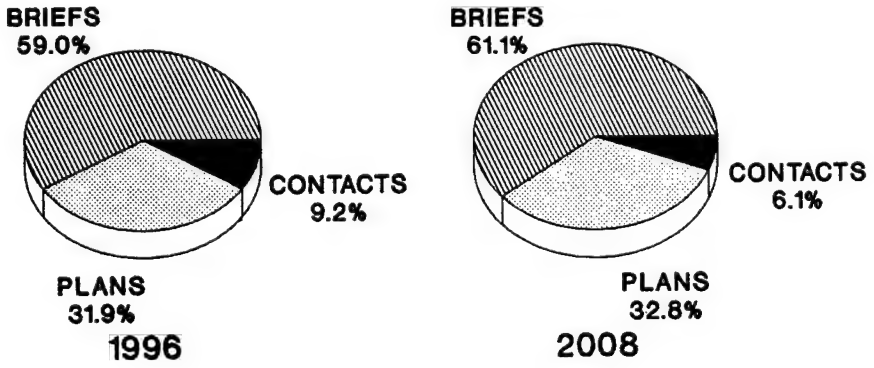
Total Flight Services

The continued decline in activity at FAA flight service stations is the result of the process of

FLIGHT SERVICES ORIGINATED AT FAA FLIGHT SERVICE STATIONS



DISTRIBUTION OF WORKLOAD BY USER GROUP



FSS consolidation, and the growing acceptance and utilization of DUATS services.

Total flight services, including non-automated and automated services, are expected to total 45.4 million in 1997, unchanged from 1996. By 2008, total flight services are forecast to reach 48.8 million, an average annual increase of 0.6 percent over the 1996 level.

Forecasts for individual flight service stations are available upon request from the Statistics and Forecast Branch, Office of Aviation Policy and Plans, (APO-110), phone (202) 267-3355.

CHAPTER VIII

FORECAST ACCURACY

CHAPTER VIII

FORECAST ACCURACY

The Federal Aviation Administration (FAA) has developed forecast models and established a forecast process that attempts to anticipate changes that may affect the future direction of the industry. Using this forecast process, the FAA provides 12-year forecasts of workload measures annually for aviation-related personnel and facility planning. The FAA frequently sponsors workshops to critique techniques and practices currently used by the FAA and other aviation forecasters and to examine the outlook for the aviation industry and its prospects for future growth. The workshops focus on the forecasting process and ways to improve the reliability and utility of forecasting results.

The tables on pages VIII-3 and VIII-4 provide some measure of the accuracy of FAA projections of aviation activity and workload at FAA facilities. The tables compare forecasts for both the short-term and the long-term periods. The short-term period, 1 to 5 years, is the critical period for personnel planning; the long-term period, for 10 years out, is important for facility planning. The two key FAA forecasts are domestic revenue passenger miles (RPMs) and aircraft handled at FAA en route centers, the former used as one of the predictors of the latter.

For short-term trends, the forecast errors normally tend to be modest: the 1996 forecast for domestic RPMs was 3.2 percent lower than final fiscal year traffic. The 8 month absence (January 1 to August 26, 1996) of the 10 percent ticket tax caused an unexpected surge in RPMs. The forecast for aircraft handled was 2.0 percent higher--39.8 million forecast versus 40.2 million actual. This error was caused by an unanticipated and unusually large decline in military operations.

The 10-year out forecast errors tend to be larger because of unanticipated external events that have long-term impacts on the aviation system. Contributing external factors to RPMs include the Gulf War and the concomitant rise in fuel prices, and the outbreaks of terrorism in 1986 and 1991. These events, plus the failure of general aviation to respond to the economic recovery of the 1980s and 1990s, affect the number of aircraft handled. Further, the FAA does not use cyclical economic projections in preparing its long-term forecasts. As a result, the 1990/1991 recession was not considered in any of the forecasts prepared prior to 1990.

THE FAA AVIATION FORECASTING PROCESS

INTRODUCTION

The FAA's forecasting process is a continuous and interactive one that involves the FAA Statistics and Forecast Branch, other FAA offices and services, other Government agencies, and aviation industry groups. In addition, the process uses various economic and aviation data bases, econometric models and equations, and other analytical techniques.

Forecasting aviation activity is an essential component of the FAA's planning process. The forecasts are used to determine staffing levels and capital expenditures that will be needed to accommodate growth of aviation activity while maintaining a safe and efficient environment. The forecasts are also used for short-term budget preparation, cost-benefit analyses, and safety analyses. The relative importance of the forecasting function in the planning process can be gauged by examining the major changes being made to the airspace infrastructure through the Capital Investment Plan out to the year 2007. These changes are being made, in large part, to accommodate the projected growth in air traffic.

To improve the air traffic control and air navigation systems, the FAA is installing new aircraft landing systems, developing new radar and communication systems, and upgrading the weather services it provides to aircraft operators. Because of the sizable investments being made in the National Airspace System, it is essential that the FAA develop and use the most accurate and reliable forecasts possible. Thus, the periodic review and evaluation of the forecasting procedures, models, forecast assumptions, and forecast results constitute essential parts of the process.

SYSTEM BACKGROUND

As part of the need to ensure safe and efficient operation of the National Airspace System, FAA operates 441 air traffic control towers (314 FAA and 127 contract--as of September 30, 1996), 22 air route traffic control centers, and 95 flight service stations (FSS). Many of the nonautomated flight service stations will be absorbed into 61 new automated facilities (AFSS). However, given the Congressional mandate to implement a system of auxiliary flight service stations in addition to the 61 AFSSs, 31 of the flight service stations that were scheduled to be closed will remain open. Also in 1997, an additional 25 towers are scheduled to be converted to contract tower status.

FAA facilities perform a large and diverse number of services for the aviation community. The FAA towers provide sequencing and separation services to pilots and aircraft arriving at or departing from individual airport facilities. These services are provided to the various categories of aircraft: air carriers, commuters/air taxis, general aviation, and military. The sum of arrivals and departures (landings and takeoffs) is generally referred to as aircraft operations. Arrivals and departures are further classified as itinerant or local operations depending on the purpose of the flight or the distance between the airports from which the landings and takeoffs were made. These operations are measures of workload or activity at individual airports. The sum of these operations at the 441 FAA and contract towers make up the national count of aircraft operations.

TABLE VIII-1

DOMESTIC REVENUE PASSENGER MILES (RPM) FORECAST EVALUATION

Year Being Forecast	Actual RPMs (Billions)	Forecast RPMs (Billions) Published -- Years Earlier					
		1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1990	339.2	341.0	352.9	364.7	361.2	340.6	330.0
1991	333.6	335.4	358.1	373.7	389.5	380.8	332.7
1992	346.7	342.7	348.8	374.9	394.3	412.9	344.1
1993	348.6	355.5	358.8	366.3	389.9	413.6	368.5
1994	371.4	358.6	375.1	375.3	383.1	407.1	397.5
1995	392.5	391.5	374.0	393.9	391.1	404.6	438.7
1996	418.6	405.3	412.2	389.0	411.6	409.1	472.0
1997		***439.5***	426.4	432.8	405.7	428.1	514.9
1998			***459.3***	448.6	451.4	422.0	517.9
1999				***477.9***	465.2	469.5	507.3
2000					***497.3***	482.4	506.0
2001						***517.5***	500.6
2002							513.4
2006							***631.4***

Year Being Forecast	Forecast RPMs Percent Error Published--Years Earlier					
	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1990	0.5	4.0	7.5	6.5	0.4	(2.7)
1991	0.5	7.3	12.0	16.8	14.1	(0.3)
1992	(1.2)	0.6	8.1	13.7	19.1	(0.7)
1993	2.0	2.9	5.1	11.8	18.6	5.7
1994	(3.4)	1.0	1.1	3.2	9.6	7.0
1995	(0.3)	(4.7)	0.4	(0.4)	3.1	11.8
1996	(3.2)	(1.5)	(7.1)	(1.7)	(2.3)	12.8

Note on how to read this table: In 1995 we forecast 405.3 billion RPMs would occur in 1996. In fact 418.6 billion RPMs were recorded, meaning the forecast was 3.2 percent lower than actual.

The 1997 forecast is shown in bold italics.

TABLE VIII-2

FAA ARTCC AIRCRAFT HANDLED FORECAST EVALUATION

Year Being Forecast	Actual Activity (Millions)	Forecast Activity Level (Millions) Published -- Years Earlier					
		1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1990	37.4	37.8	38.2	39.2	38.7	38.4	42.2
1991	36.1	38.5	39.1	39.7	40.3	39.6	40.3
1992	36.5	37.3	39.6	40.1	40.8	41.4	39.3
1993	37.4	37.5	38.3	40.6	41.0	41.6	40.7
1994	38.8	37.9	38.4	39.4	41.5	41.9	43.6
1995	40.0	39.8	38.6	39.3	40.3	42.7	43.6
1996	40.3	41.1	40.7	39.4	40.0	41.1	44.0
1997		***40.9***	42.2	41.5	40.3	40.7	46.0
1998			***41.8***	43.4	42.4	41.1	46.1
1999				***42.5***	44.4	43.4	46.0
2000					***43.5***	45.3	47.1
2001						***44.4***	46.6
2002							45.1
2006							***48.5***

Year Being Forecast	Forecast Activity Percent Error Published--Years Earlier					
	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1990	1.1	2.1	4.8	3.5	2.7	12.8
1991	6.6	8.3	10.0	11.6	9.7	11.6
1992	2.2	8.5	9.9	11.8	13.4	7.7
1993	0.3	2.4	8.6	9.6	11.2	8.8
1994	(2.3)	(1.0)	1.5	7.0	8.0	12.4
1995	(0.5)	(3.5)	(1.8)	0.7	6.8	9.0
1996	2.0	1.0	(2.2)	(0.7)	2.0	9.2

Note on how to read this table: In 1995 we forecast 41.1 million aircraft would be handled in 1996. In fact 40.3 million aircraft were recorded, meaning the forecast was 2.0 percent higher than actual.

The 1997 forecast is shown in bold italics.

Another activity measure at FAA towered airports is the number of instrument operations, i.e., aircraft operations performed in accordance with an instrument flight rule (IFR) flight plan, or an aircraft flight where IFR separation between aircraft is provided by the facility. Instrument operations are further subdivided into: (1) primary instrument operations--separations and sequencing services provided to aircraft landing at the airport providing the service; (2) secondary instrument operations--services provided to aircraft landing at a nearby airport; and (3) overs--services provided to aircraft that originate outside the ARTCC area and pass through the area without landing. Another contributor to workload is advisory services offered to aircraft flying under visual flight rules (VFR) in certain positively controlled airspace.

Each ARTCC controls aircraft that are flying under instrument flight rules in the center's designated geographic control area. The workload measure for the centers is the number of IFR aircraft handled, which is two times departures, plus overs. The IFR counts are categorized by user groups.

Flight service stations provide a variety of services to the aviation community. They collect and disseminate meteorological and other flight information, provide briefings to pilots, and provide assistance in emergencies to lost, disoriented, or downed airmen. The workload measure at flight service stations, total flight services, is equal to the sum of flight plans filed and pilot briefs, multiplied by two, plus the number of aircraft contacted.

The introduction of new technology to flight service stations has changed operating environments. It appears that an apparent decline in demand for flight planning services may actually signify that demand is being met through increased use of automation and new system capabilities. This results in increased system efficiency and productivity.

The FAA must consider at least 133 variables when producing a set of national forecasts. (The number does not include derived subtotals and totals.) Of these, four economic independent variables are obtained from sources external to the FAA and the FAA has no control over these truly exogenous variables. There are 12 quantifiable air carrier forecast assumptions and 4 quantifiable regional/commuter carrier forecast assumptions. Within justifiable limits, these forecast assumptions are under the control of the analysts who develop the forecast. There are 83 aviation variables that are not FAA workload measures but that influence the workload measures in one way or another. Finally, there are 30 aviation variables that are the workload measures used by the FAA for policy and planning considerations and for personnel and investment planning.

The table at the end of this chapter contains a list of the variables and the sources of the historical data and their relationship to the forecast process. Forecasts of the economic variables are developed outside the FAA. All other forecasts are developed by the FAA.

Research undertaken in the early- and mid-1970s indicated that some measures of economic activity (such as gross domestic product or total employment) and some measures of prices (for example, aircraft prices and aviation fuel prices) were useful predictors of aviation activity. Some unique events (including the failure of U.S. air carriers to follow rational pricing policies; e.g., the destructive fare wars of 1986 and 1992; and the prolonged depressed state of the general aviation manufacturing industry) have altered the relationships between the key aviation variables and the economic variables used previously. It has been difficult, therefore, to produce economic or econometric models that predict aviation activity with the same degree of reliability as the models developed in earlier periods. Thus, for the present, the forecasters must rely to a greater degree on subjective judgment, evaluation, and expertise than was required

previously. This is not at all unusual in times of significant change in a volatile industry.

THE FAA FORECASTING PROCESS

The FAA forecasting process is an interactive system that combines econometric and time series model results with aviation industry forecasts, expert opinions, and anticipated policy impacts to derive a set of FAA aviation forecasts that are used in the FAA decisionmaking process. The following flow diagram shows a generalized version of the FAA aviation forecasting process.

The first step in developing the forecasts is to enter the economic and demographic variables into a set of econometric models or equations that represent a simplified version of the real world. The degree of accuracy of the forecasts of aviation activities depends on both the accuracy of the forecasts of the independent variables and the ability of the models to portray activities in the real world.

The mechanical execution of forecast models is only the first step in producing a set of forecasts. In general, these models and equations are simple portrayals of a complex system. They cannot account for a number of political, social, psychological, and economic variables and for all the interrelated actions and reactions that eventually lead to a particular set of results. It is particularly important, therefore, that the initial model results are reviewed, revised, and adjusted to reflect the analysts' best judgment of the impacts of the events occurring or expected to occur during the forecast period.

The FAA forecasting process is both continuous and iterative. As such, it is important to evaluate the forecast results and to determine the causes of the deviations of the forecast values from the actual values observed in the real world. The analysis of the errors generally identifies the causes of the deviations and helps determine the proportion due to improper model specifications, erroneous forecasts of independent variables, erroneous forecast assumptions, or incorrect judgments and opinions. If warranted, the forecast error analysis may lead to a reformulation of the model and to additions or deletions of independent variables, revisions of forecast assumptions, and/or changes in analysts' opinions and judgments about future events.

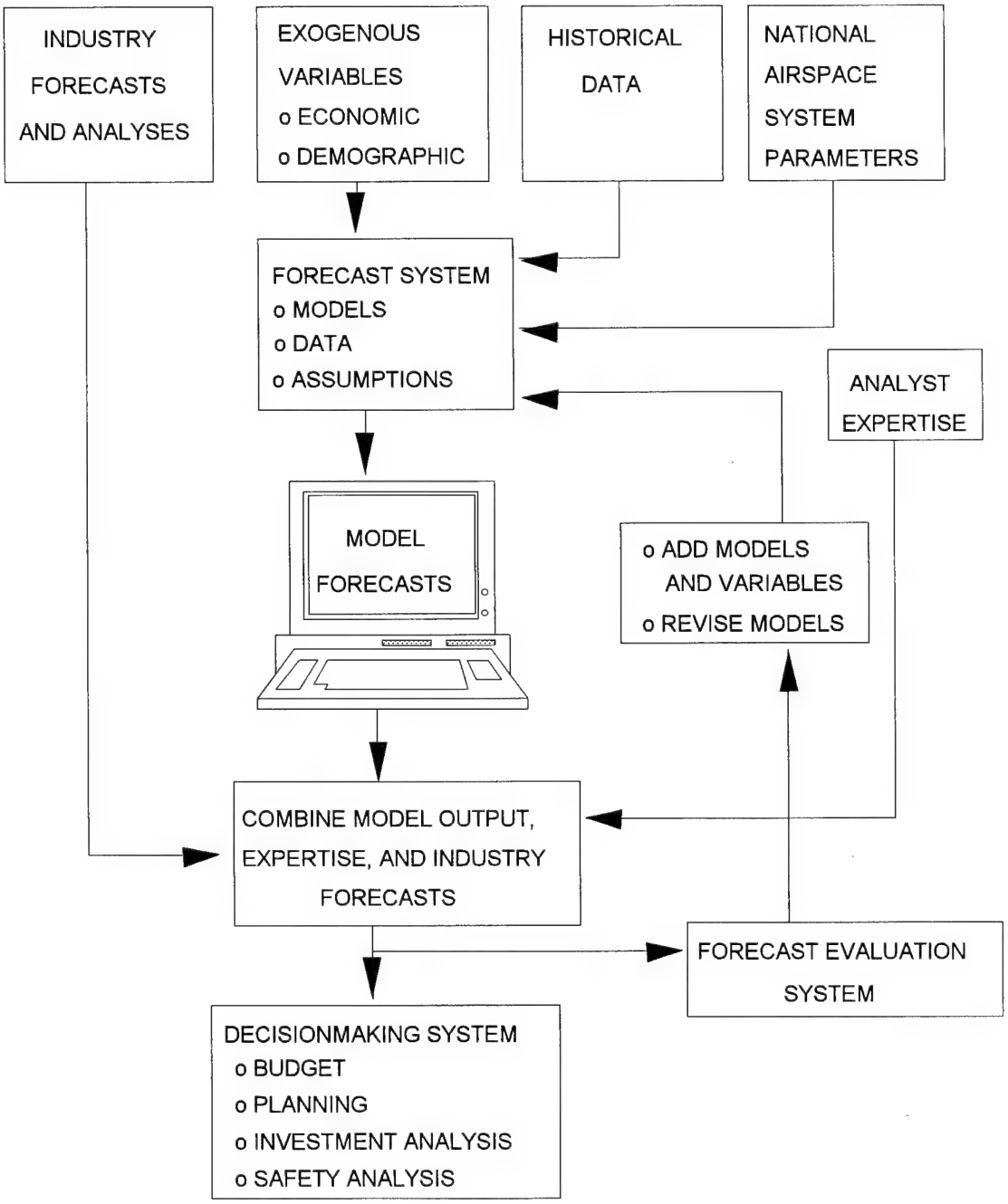
FORECAST EVALUATION

It is essential that the FAA forecasts of the demand for services at the FAA and contract towers, air route traffic control centers, and the flight service stations be accurate. Large forecast errors can lead to inefficient allocation of resources which, in turn, could lead to capacity constraints and delays or to excess capacity in the National Airspace System. For this reason, FAA must continuously evaluate the forecasting process and its results.

The evaluation of the forecast process proceeds on several fronts. On a monthly basis, FAA tracks its short-term forecasts of commercial air carrier traffic (enplanements and RPMs), aircraft operations, instrument operations, IFR aircraft handled, and flight services vis-à-vis the actual counts at the facilities. This tracking system alerts FAA management to unexpected deviations from the trends suggested by the forecasts. Inquiries are then initiated to determine the cause(s) of the differences and revised short-term forecasts may be generated, if necessary.

To help the analysts make correct decisions and informed judgments when developing the forecast assumptions, FAA holds meetings with industry representatives to discuss industry trends, recent developments, and possible future

FAA FORECASTING SYSTEM



courses of events. Every 2 years, for example, in cooperation with the National Academy of Sciences, Transportation Research Board (TRB), the FAA sponsors an International Workshop on Future Aviation Activities--"forecast assumptions workshop." This workshop is attended by 70 to 80 industry planners and forecasters representing the airlines, aircraft manufacturers, engine manufacturers, and other industry groups.

The participants in various subgroups identify specific assumptions about the short-term and long-term future trends of the economic and aviation variables that are important to their segments of the industry, indicate why these are considered important, and show why specific trends are anticipated. After discussing the assumptions, the entire group attempts to reach a consensus about the key variables affecting the industry and the most likely future courses of these variables. Finally, the TRB publishes a workshop report. The participants benefit from the discussions and the analysts have the TRB workshop report as a benchmark for preparing forecasts or for evaluating forecasts prepared by other organizations. Assumptions developed at the TRB's ninth workshop (September 18-20, 1995) were used extensively in preparing last year's forecasts. The tenth workshop is tentatively planned for September 1997, funds permitting.

Formal and informal meetings with individuals and representatives of specific industry groups are another way the FAA promotes dialogue and discussion with the aviation community and solicits input and comments. Meetings are held regularly with the aircraft manufacturers, with members of the Air Transport Association, and with members of the General Aviation Manufacturers Association, Helicopter Association International, and other general aviation organizations. In addition, FAA analysts maintain one-on-one contact with industry representatives.

Another intermediate step in the FAA aviation forecast process is the public dissemination of the forecast results, solicitation of industry comments, and critique of the forecasts. One of the main avenues for this purpose is the Commercial Aviation Forecast Conference held annually in March. Now in its twenty-second year, the conference is generally attended by 500 participants who include airline executives, aircraft and engine manufacturers, consumer groups and other industry representatives, and the news media. To the maximum extent possible, FAA responds to questions raised about the forecasts both during and after the conference. The conference is being expanded to a second day in 1997 to allow discussion of the implications of the FAA forecasts for various segments of the industry.

Because the importance of U.S. general aviation and the fact that its issues and problems cannot be adequately addressed in a single conference, the FAA also holds an annual 2-day General Aviation Forecast Conference. This conference, now in its seventh year, is attended by 250 participants from all segments of the general aviation community.

An important part of the two conferences is the opportunity for various segments of the aviation community to make technical presentations on a variety of topics of interest to the aviation community. The forecast conferences establish avenues of communication through which FAA releases its forecast to the aviation community and the general public and receives comments, criticisms, and feedback about the forecasts. The FAA also receives valuable information and insights through the papers presented at the forecast conferences. These papers are published annually in individual conference proceedings and are distributed to all conference attendees or by request.

FAA also seeks to improve forecast accuracy and credibility by inviting FAA regional and State participation in the forecast process. For example, facility-level terminal area forecasts,

forecasts of aircraft handled at the ARTCCs, and flight service station forecasts are circulated to FAA regions for review and comments. The comments and suggested changes are incorporated in the final facility level reports. In the case of the terminal area forecasts, the FAA regions have the capability to make changes on personal computers. The final facility-level forecasts derived by this procedure must be consistent with the national forecasts.

Periodically, FAA prepares a technical report that compares the accuracy of the forecasts of key workload measures with the accuracy of forecasts of economic variables prepared by major forecasting services. Based on the results of these studies, the FAA forecasts compare favorably with those produced by these major forecasting services.

TABLE VIII-3

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
ECONOMIC	
ECONOMIC ASSUMPTIONS	
Gross Domestic Product (GDP)	OMB, DRI, WEFA
Consumer Price Index (CPI)	OMB, DRI, WEFA
Oil and Gas Deflator	OMB, DRI, WEFA
AIR CARRIER	
FORECAST ASSUMPTIONS	
Domestic Operations	
Average seats per aircraft	BTS/computed
Average passenger trip length	BTS/computed
Revenue per passenger mile (current $)	BTS/computed
Revenue per passenger mile (1996 $)	Computed
Average jet fuel prices (current $)	BTS/computed
Average jet fuel prices (1996 $)	Computed
International Operations (U.S. Carriers)	
(Same as Domestic)	(Same)
SCHEDULED PASSENGER TRAFFIC	
Domestic	
Revenue passenger miles (RPMs)	BTS
Revenue passenger enplanements	BTS
Available seat miles	BTS
Load factors	Computed
International (U.S. Carriers)	
Revenue passenger miles by World Regions	BTS
Revenue passenger enplanements by World Regions	BTS
Available seat miles by World Region	BTS
Load factors	Computed

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (CONTINUED)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
AIR CARRIER (CONTINUED)	
SCHEDULED PASSENGER TRAFFIC (CONTINUED)	
International (U.S. and Foreign Flag Carriers)	
Passenger enplanements	INS
FLEET	
Large jet aircraft	FAA/AFS-620
HOURS FLOWN BY EQUIPMENT TYPE	
Large jet aircraft	BTS
FUEL CONSUMED	
Jet	
Domestic air carriers	BTS
International air carriers	BTS
General aviation	FAA/APO-110
Aviation Gasoline	FAA/APO-110
REGIONAL/COMMUTER	
FORECAST ASSUMPTIONS	
Average seats per aircraft	BTS/Computed
Average passenger trip length (48 States and Hawaii, Puerto Rico, Virgin Islands)	BTS/Computed
Average load factor	BTS/Computed
PASSENGER TRAFFIC	
Revenue passenger enplanements (48 States and Hawaii, Puerto Rico, Virgin Islands)	BTS
Revenue passenger miles (48 States and Hawaii, Puerto Rico, Virgin Islands)	BTS

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (CONTINUED)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
REGIONAL/COMMUTER (CONTINUED)	
FLEET	
Aircraft less than 60 seats	FAA
HOURS FLOWN	
Total for all passenger airlines	BTS
GENERAL AVIATION	
FLEET	
Active aircraft by equipment type	FAA/APO-110
NUMBER OF AIRCRAFT BY REGION	
Total aircraft in each of nine FAA Regions	FAA/APO-110
HOURS FLOWN	
Hours flown by equipment type	FAA/APO-110
FUEL CONSUMED	
Fuel consumed by equipment type	FAA/APO-110
PILOTS	
Active pilots by certificate type	FAA/APO-110

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (CONTINUED)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
FAA WORKLOAD MEASURES	
FAA TOWERS	
Number of FAA Towers	FAA/APO-130
Number of Contract Towers	FAA/ATR-107
Aircraft Operations:	
Itinerant and local operations by aviation category	FAA/APO-130
Instrument operations by aviation category	FAA/APO-130
Non-IFR Instrument Operations:	
Terminal control areas	FAA/APO-130
Expanded radar service areas	FAA/APO-130
AIR ROUTE TRAFFIC CONTROL CENTERS	
IFR departures by aviation category	FAA/APO-130
IFR overs by aviation category	FAA/APO-130
FLIGHT SERVICE STATIONS	
IFR-DVFR flight plans originated	FAA/APO-130
VFR flight plans originated	FAA/APO-130
Pilot briefings	FAA/APO-130
Aircraft contacted by aviation category	FAA/APO-130
IFR-DVFR aircraft contacted	FAA/APO-130
VFR aircraft contacted	FAA/APO-130

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (CONTINUED)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
TERMINAL AREA FORECASTS (3,800 Towered and Nontowered Airports)	
ENPLANEMENTS	
U. S. Flag Carrier	BTS
Foreign Flag Carrier	INS/BTS
Regional/Commuter	BTS
Air Taxi	FAA/VNTSC
OPERATIONS	
Towered Airports:	
Aircraft operations by aviation segment	FAA/APO-130
Scheduled commuter	OAG
Nontowered Airports	FAA/NFDC
Scheduled commuter	OAG

OMB--Office of Management and Budget
DRI--DRI/McGraw-Hill, Inc.
WEFA--The WEFA Group
BTS--Bureau of Transportation Statistics, Department of Transportation
AFS-620--Operations Systems Branch, FAA
APO-110--Statistics and Forecast Branch, FAA
APO-130--Information Systems Branch, FAA
INS--Immigration and Naturalization Service, Department of Justice
VNTSC--Volpe National Transportation Systems Center, Research and Special Programs Administration, Department of Transportation
NFDC--National Flight Data Center, FAA
OAG--North American Official Airline Guide

CHAPTER IX

YEAR-BY-YEAR DATA FOR FAA AVIATION FORECASTS

CHAPTER IX

YEAR-BY-YEAR DATA FOR FAA AVIATION FORECASTS

FISCAL YEARS 1997 - 2008

Chapter IX provides the detailed data for the National Aviation and FAA workload series forecasted by the FAA Office of Aviation Policy and Plans. The following should be noted:

- Table 11 - Contains the unduplicated passenger traffic reported by U.S. scheduled air carriers reporting on BTS Form 41 and commuter carriers reporting on BTS Form 298-C.

- Table 12 - Includes the following traffic which is also reported as regionals/commuters traffic in Table 20.

YEAR	ENPLANEMENTS (Millions)	RPMs (Millions)
1987	2.183	533.8
1988	2.239	430.6
1989	3.257	673.5
1990	4.078	853.7
1991	6.096	1,188.3
1992	9.765	1,857.1
1993	12.283	2,484.8
1994	16.250	3,405.5
1995	21.733	4,701.2
1996E	25.478	5,696.9

Table 20 - Includes the duplicated traffic listed above for those air carriers and regionals/commuters reporting on both BTS Form 41 and 298-C (forecasts and historical data exclude Alaska and foreign territory traffic).

- Table 21 - Includes only aircraft with 60 seats or less.

- Table 27 - Includes the rotorcraft fleet and hours flown shown in Tables 22 and 24.

TABLE 1

U.S. SHORT-TERM ECONOMIC FORECEASTS

ECONOMIC VARIABLE	FISCAL YEAR 1997				FISCAL YEAR 1998			
	1ST. QTR.	2ND. QTR.	3RD QTR.	4TH. QTR.	1ST. QTR.	2ND. QTR.	3RD QTR.	4TH. QTR.
REAL GDP								
(1992 Chained $)								
DRI/McGRAW-HILL	6,962.5	6,998.6	7,035.6	7,076.6	7,120.7	7,169.2	7,207.8	7,238.4
THE WEFA GROUP	6,959.5	6,991.8	7,023.2	7,062.2	7,100.0	7,141.0	7,181.2	7,221.0
OMB	6,967.3	7,003.6	7,039.0	7,073.6	7,108.2	7,143.4	7,178.6	7,213.5
OIL AND GAS PRICE INDEX								
(1992 EQUALS 100)*								
DRI/McGRAW-HILL	106.0	107.4	106.4	104.4	104.3	105.1	105.9	106.4
THE WEFA GROUP	107.3	108.3	107.9	107.7	108.3	108.9	109.3	109.9
OMB	114.4	111.5	104.6	99.5	100.2	100.8	101.5	102.2
CONSUMER PRICE INDEX								
(1982-84 EQUALS 100)								
DRI/McGRAW-HILL	155.8	156.9	157.9	158.8	159.9	161.0	162.2	163.4
THE WEFA GROUP	155.7	156.7	157.6	158.5	159.6	160.7	161.8	162.8
OMB	155.7	156.7	157.8	158.8	159.8	160.9	161.9	163.0

Source: DRI/McGraw-Hill, Inc., December 1996; The WEFA Group, December 1996; and OMB, December 1996
* DRI/McGraw-Hill and WEFA use a slightly different index than the one used by OMB.
The quarter-to-quarter changes of the two indices are comparable.

TABLE 2

U.S. LONG-TERM ECONOMIC FORECASTS

OMB (1996-2007) AND CONSENSUS (2008)

FISCAL YEAR	GROSS DOMESTIC PRODUCT (Billions 1992$)	CONSUMER PRICE INDEX (1982-84=100)	OIL AND GAS PRICE INDEX (1992 = 100)
Historical			
1990	6,141.7	129.0	98.7
1991	6,073.3	134.8	100.8
1992	6,188.7	137.2	100.1
1993	6,350.9	141.1	99.3
1994	6,552.5	144.7	99.5
1995	6,721.2	148.8	101.2
1996E	6,854.3	153.0	104.3
Forecast			
1997	7,020.9	157.3	107.5
1998	7,160.9	161.4	101.2
1999	7,312.8	165.8	103.8
2000	7,481.6	170.2	106.5
2001	7,655.4	174.8	109.2
2002	7,831.9	179.6	112.1
2003	8,012.8	184.4	115.0
2004	8,198.0	189.4	117.9
2005	8,385.6	194.5	121.0
2006	8,579.3	199.7	124.1
2007	8,777.8	205.2	127.3
2008	8,955.1	212.0	132.1

Source: 1996-2007; Office of Management and Budget, December 1996 2008;
Consensus forecast based on average growth rates of DRI/McGraw-Hill,
and WEFA forecasts (See Table 3), adjusted to fiscal year basis.

TABLE 3

ALTERNATIVE U.S. LONG-TERM ECONOMIC FORECASTS

CALENDAR YEAR	GROSS DOMESTIC PRODUCT (Billions 1992$)			CONSUMER PRICE INDEX (1982-84 = 100)			FUEL PRICE INDEX (1992 = 100)		
	DRI	WEFA	CONSENSUS	DRI	WEFA	CONSENSUS	DRI	WEFA	CONSENSUS
Historical									
1991	6,078.9	6,078.9	6,078.9	134.1	134.1	134.1	100.5	100.5	100.5
1992	6,244.4	6,244.4	6,244.4	138.2	138.2	138.2	100.0	100.0	100.0
1993	6,386.4	6,386.4	6,386.4	142.1	142.1	142.1	99.0	99.0	99.0
1994	6,608.7	6,608.7	6,608.7	145.7	145.7	145.7	99.6	99.6	99.6
1995	6,742.9	6,742.9	6,742.9	149.8	149.8	149.8	101.1	101.1	101.1
1996E	6,899.5	6,898.0	6,898.8	154.2	154.1	154.2	106.4	106.7	106.6
Forecast									
1997	7,040.4	7,044.0	7,042.2	158.4	158.1	158.3	105.0	108.1	106.6
1998	7,194.5	7,200.0	7,197.3	162.9	162.4	162.7	106.7	109.7	108.2
1999	7,357.4	7,359.0	7,358.2	167.5	166.9	167.2	106.9	112.0	109.5
2000	7,521.7	7,517.0	7,519.4	172.7	171.5	172.1	110.6	114.7	112.7
2001	7,670.8	7,684.0	7,677.4	178.5	175.9	177.2	114.8	120.0	117.4
2002	7,833.3	7,854.0	7,843.7	184.6	180.4	182.5	119.4	125.1	122.3
2003	7,999.1	8,026.0	8,012.6	191.1	185.0	188.1	124.4	130.2	127.3
2004	8,168.4	8,199.0	8,183.7	198.1	189.7	193.9	129.8	134.9	132.4
2005	8,337.0	8,369.0	8,353.0	205.6	194.6	200.1	135.4	139.5	137.5
2006	8,502.5	8,546.0	8,524.3	213.7	199.6	206.7	141.3	144.0	142.7
2007	8,661.9	8,725.0	8,693.5	222.3	204.9	213.6	147.6	148.6	148.1
2008	8,831.7	8,909.0	8,870.4	231.1	210.2	220.7	154.1	153.3	153.7

Source: DRI/McGraw-Hill, November, 1996 and the WEFA Group, January, 1997

TABLE 4

INTERNATIONAL GDP FORECASTS

CALENDAR YEAR	GROSS DOMESTIC PRODUCT (In Billions of 1990 U.S. Dollars) EUROPE/ AFRICA/ MIDDLE EAST	LATIN AMERICA	JAPAN/PACIFIC BASIN/CHINA/OTHER ASIA/AUSTRALIA/ N. ZEALAND	WORLD
Historical*				
1991	8,657.2	1,111.8	5,081.2	23,245.2
1992	8,795.5	1,142.6	5,248.0	23,417.8
1993	8,800.4	1,186.0	5,405.3	23,599.4
1994	9,021.8	1,248.8	5,602.1	24,099.9
1995	9,254.5	1,253.7	5,809.0	24,626.2
1996E	9,422.5	1,295.0	6,112.5	25,266.3
Forecast				
1997	9,657.3	1,355.0	6,376.5	26,023.1
1998	9,926.3	1,421.4	6,692.2	26,922.5
1999	10,195.9	1,483.4	7,010.9	27,832.6
2000	10,471.0	1,545.3	7,336.2	28,747.0
2001	10,753.4	1,616.8	7,672.4	29,701.0
2002	11,056.6	1,702.7	8,039.7	30,732.0
2003	11,365.2	1,795.2	8,429.9	31,809.3
2004	11,673.8	1,883.9	8,836.5	32,907.9
2005	11,990.0	1,947.9	9,267.7	34,042.7
2006	12,312.7	2,067.1	9,710.0	35,212.4
2007	12,650.9	2,160.9	10,176.6	36,425.2
2008	13,000.6	2,255.9	10,662.7	37,678.4

Source: The WEFA Group, World Economic Outlook, October 1996

TABLE 5

INTERNATIONAL EXCHANGE RATE FORECASTS

CALENDAR YEAR	FOREIGN EXCHANGE RATES (US$/Local Currency, Average)			UNITED STATES OECD TRADE-WEIGHTED NOMINAL EXCHANGE RATE (1990 EQUALS 100)
	UNITED KINGDOM	WEST*/UNITED GERMANY	JAPAN	
Historical*				
1991	1.764	0.603	7.433	98.9
1992	1.755	0.640	7.896	98.2
1993	1.500	0.605	8.994	102.2
1994	1.530	0.616	9.779	101.7
1995	1.578	0.698	10.632	96.6
1996E	1.553	0.665	9.224	101.9
Forecast				
1997	1.567	0.637	9.050	105.6
1998	1.512	0.617	8.969	107.0
1999	1.489	0.612	9.132	106.6
2000	1.468	0.615	9.220	105.5
2001	1.452	0.619	9.314	104.4
2002	1.435	0.614	9.408	103.6
2003	1.438	0.617	9.503	102.9
2004	1.441	0.621	9.599	102.4
2005	1.445	0.624	9.696	101.8
2006	1.450	0.627	9.794	101.1
2007	1.456	0.630	9.892	100.4
2008	1.463	0.633	9.992	99.7

Source: The WEFA Group, World Economic Outlook, October 1996

TABLE 6

BASELINE U.S. AIR CARRIER FORECAST ASSUMPTIONS

TOTAL SYSTEM OPERATIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE		AVERAGE JET FUEL PRICE	
			CURRENT $ (Cents)	FY 1996 $ (Cents)	CURRENT $ (Cents)	FY 1996 $ (Cents)
Historical*						
1991	167.8	986.8	12.83	14.57	79.4	90.1
1992	168.3	1,005.0	12.55	14.00	64.5	71.9
1993	166.4	1,008.7	13.05	14.14	61.9	67.1
1994	163.2	983.8	12.76	13.50	56.5	59.7
1995	160.3	985.4	12.73	13.09	55.6	57.1
1996E	159.0	992.6	13.08	13.08	62.5	62.5
Forecast						
1997	162.4	999.3	13.13	12.77	64.4	62.7
1998	164.7	1,003.3	13.18	12.50	60.7	57.5
1999	165.9	1,008.6	13.44	12.41	62.2	57.4
2000	167.1	1,013.9	13.70	12.32	63.8	57.4
2001	169.5	1,020.5	13.97	12.23	65.4	57.3
2002	171.9	1,027.1	14.24	12.13	67.2	57.2
2003	174.3	1,033.8	14.51	12.04	68.9	57.2
2004	176.5	1,039.3	14.80	11.96	70.7	57.1
2005	178.7	1,044.8	15.09	11.87	72.5	57.0
2006	180.9	1,049.9	15.38	11.79	74.4	57.0
2007	183.0	1,055.1	15.69	11.70	76.3	56.9
2008	185.2	1,060.1	16.02	11.56	79.3	57.2

* Source: BTS, Form 41, U.S. Department of Transportation

TABLE 7

BASELINE U.S. AIR CARRIER FORECAST ASSUMPTIONS

DOMESTIC OPERATIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE		AVERAGE JET FUEL PRICE	
			CURRENT $ (Cents)	FY 1996 $ (Cents)	CURRENT $ (Cents)	FY 1996 $ (Cents)
Historical*						
1991	151.0	807.0	13.31	15.11	76.6	86.9
1992	150.5	805.9	12.92	14.41	62.7	69.9
1993	149.7	803.2	13.67	14.81	60.0	65.0
1994	146.6	786.7	13.37	14.14	54.7	57.8
1995	143.3	791.0	13.31	13.69	54.1	55.6
1996E	142.0	799.4	13.86	13.86	61.2	61.2
Forecast						
1997	145.2	804.6	13.86	13.48	63.1	61.3
1998	147.2	806.6	13.86	13.14	59.4	56.3
1999	148.2	808.6	14.14	13.05	60.9	56.2
2000	149.2	810.6	14.42	12.96	62.5	56.2
2001	151.2	812.6	14.71	12.87	64.1	56.1
2002	153.2	814.6	15.00	12.78	65.8	56.0
2003	155.2	816.6	15.30	12.70	67.5	56.0
2004	157.2	818.6	15.61	12.61	69.2	55.9
2005	159.2	820.6	15.92	12.52	71.0	55.8
2006	161.2	822.6	16.24	12.44	72.8	55.8
2007	163.2	824.6	16.56	12.35	74.7	55.7
2008	165.2	826.6	16.90	12.19	77.6	56.0

* Source: BTS, Form 41, U.S. Department of Transportation

TABLE 8

BASELINE U.S. AIR CARRIER FORECAST ASSUMPTIONS

INTERNATIONAL OPERATIONS (PART 1)

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE		AVERAGE JET FUEL PRICE	
			CURRENT $ (Cents)	FY 1996 $ (Cents)	CURRENT $ (Cents)	FY 1996 $ (Cents)
Historical*						
1991	262.8	2,856.4	11.43	12.98	87.7	99.5
1992	255.9	3,016.5	11.55	12.88	69.6	77.6
1993	244.4	2,981.9	11.45	12.41	67.5	73.2
1994	243.6	2,992.5	11.14	11.78	61.5	65.0
1995	247.6	2,973.0	11.17	11.48	59.8	61.5
1996E	247.8	3,003.6	10.93	10.93	66.3	66.3
Forecast						
1997	249.1	3,000.8	11.12	10.82	68.3	66.5
1998	250.4	2,998.5	11.34	10.75	64.3	61.0
1999	251.8	3,002.8	11.58	10.68	66.0	60.9
2000	253.3	3,005.4	11.81	10.62	67.7	60.8
2001	254.5	3,011.0	12.06	10.55	69.4	60.7
2002	256.1	3,011.6	12.32	10.49	71.2	60.7
2003	257.7	3,011.0	12.57	10.43	73.1	60.6
2004	258.6	3,010.0	12.83	10.37	74.9	60.5
2005	259.6	3,012.2	13.10	10.31	76.9	60.5
2006	260.7	3,012.8	13.37	10.24	78.9	60.4
2007	261.7	3,015.8	13.65	10.18	80.9	60.3
2008	262.8	3,019.0	14.02	10.12	84.1	60.7

* Source: BTS, Form 41, U.S. Department of Transportation

TABLE 9

BASELINE U.S. AIR CARRIER FORECAST ASSUMPTIONS

INTERNATIONAL OPERATIONS (PART 2)

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT			REVENUE PER PASSENGER MILE					
				ATLANTIC		LATIN AMERICA		PACIFIC	
	ATLANTIC (Seats)	LATIN AMERICA (Seats)	PACIFIC (Seats)	CURRENT $ (Cents)	FY 1996 $ (Cents)	CURRENT $ (Cents)	FY 1996 $ (Cents)	CURRENT $ (Cents)	FY 1996 $ (Cents)
Historical*									
1991	257.7	187.0	321.9	9.98	11.33	12.43	14.11	12.48	14.16
1992	245.2	182.8	320.2	9.89	11.03	13.35	14.89	12.77	14.24
1993	231.9	179.1	318.3	9.38	10.16	13.66	14.80	13.00	14.09
1994	233.3	177.7	320.2	9.29	9.82	14.08	14.89	12.18	12.88
1995	238.2	180.1	322.0	9.88	10.16	13.70	14.09	11.55	11.88
1996E	237.2	181.1	326.6	10.25	10.25	13.57	13.57	10.50	10.50
Forecast									
1997	239.2	181.5	328.0	10.54	10.25	13.67	13.30	10.58	10.29
1998	240.5	182.0	330.0	10.76	10.20	13.89	13.17	10.75	10.19
1999	241.5	182.5	332.0	11.00	10.15	14.17	13.07	10.96	10.12
2000	242.5	183.0	335.0	11.23	10.10	14.44	12.98	11.17	10.04
2001	242.5	183.0	338.0	11.48	10.05	14.73	12.89	11.40	9.97
2002	242.5	184.0	342.0	11.73	10.00	15.03	12.80	11.63	9.90
2003	242.5	185.0	346.0	11.99	9.95	15.32	12.71	11.85	9.84
2004	242.5	185.0	350.0	12.25	9.90	15.63	12.62	12.09	9.77
2005	242.5	185.0	354.0	12.52	9.85	15.93	12.53	12.33	9.70
2006	242.5	185.0	358.0	12.79	9.80	16.25	12.45	12.57	9.63
2007	242.5	185.0	362.0	13.07	9.75	16.58	12.36	12.83	9.56
2008	242.5	185.0	366.0	13.44	9.70	17.01	12.27	13.16	9.50

* Source: BTS, Form 41, U.S. Department of Transportation

TABLE 10

UNITED STATES AND FOREIGN FLAG CARRIERS

TOTAL PASSENGER TRAFFIC TO/FROM THE UNITED STATES

CALENDAR YEAR	TOTAL PASSENGERS BY WORLD TRAVEL AREA (Millions)			
	ATLANTIC	LATIN AMERICA	PACIFIC	TOTAL
Historical*				
1991	27.2	26.2	15.4	68.8
1992	31.3	26.9	17.0	75.2
1993	33.0	29.2	17.6	79.8
1994	34.7	30.7	18.8	84.2
1995	37.0	32.1	20.8	89.9
1996F	38.5	33.9	22.4	94.8
Forecast				
1997	40.4	36.2	23.8	100.4
1998	42.5	38.7	25.5	106.7
1999	44.6	41.1	27.3	113.0
2000	46.8	43.5	29.0	119.3
2001	49.0	46.3	30.8	126.1
2002	51.4	49.5	32.8	133.7
2003	53.8	52.9	34.9	141.6
2004	56.3	56.2	37.1	149.6
2005	58.8	59.6	39.3	157.7
2006	61.3	63.1	41.7	166.1
2007	64.0	66.6	44.2	174.8
2008	66.7	70.1	46.8	183.6

* Source: INS Form I-92, U.S. Department of Commerce.
F = Forecast

TABLE 11

UNITED STATES COMMERCIAL AIR CARRIERS AND REGIONALS/COMMUTERS

TOTAL SCHEDULED U.S. PASSENGER TRAFFIC 1/

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (Millions)			REVENUE PASSENGER MILES (Billions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
Historical*						
1991	445.9	39.7	485.6	339.4	113.5	452.9
1992	463.2	42.6	505.8	353.0	128.5	481.5
1993	468.5	45.2	513.7	355.5	134.8	490.3
1994	509.0	46.3	555.3	379.0	138.6	517.6
1995	527.8	48.6	576.4	399.3	144.3	543.6
1996E	555.6	50.3	605.9	425.7	151.1	576.8
Forecast						
1997	586.0	53.1	639.1	448.7	159.4	608.1
1998	611.4	56.1	667.5	469.1	168.3	637.4
1999	635.6	59.2	694.8	488.5	177.9	666.4
2000	660.9	62.6	723.5	508.7	188.2	696.9
2001	686.9	66.5	753.4	529.6	200.2	729.8
2002	714.0	70.8	784.8	551.4	213.3	764.7
2003	741.7	75.5	817.2	574.1	227.0	801.1
2004	770.5	79.8	850.3	597.7	240.1	837.8
2005	800.3	84.2	884.5	622.3	253.8	876.1
2006	831.3	88.9	920.2	647.8	267.8	915.6
2007	863.3	93.6	956.9	674.3	282.5	956.8
2008	896.4	98.5	994.9	701.9	297.6	999.5

* Source: BTS, Forms 41 and 298-C, U.S. Department of Transportation
1/ Sum of Table's 11 and 19 less duplicated traffic.

TABLE 12

UNITED STATES COMMERCIAL AIR CARRIERS

SCHEDULED PASSENGER TRAFFIC

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (Millions)			REVENUE PASSENGER MILES (Billions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
Historical*						
1991	413.3	39.7	453.1	333.6	113.5	447.1
1992	430.3	42.6	472.9	346.7	128.5	475.2
1993	434.0	45.2	479.2	348.6	134.8	483.4
1994	472.1	46.3	518.4	371.4	138.6	510.0
1995	496.3	48.6	544.8	392.5	144.3	536.9
1996E	523.6	50.3	573.9	418.6	151.1	569.6
Forecast						
1997	546.2	53.1	599.3	439.5	159.4	598.9
1998	569.4	56.1	625.5	459.3	168.3	627.6
1999	591.0	59.2	650.2	477.9	177.9	655.8
2000	613.5	62.6	676.1	497.3	188.2	685.5
2001	636.8	66.5	703.3	517.5	200.2	717.7
2002	661.1	70.8	731.9	538.5	213.3	751.8
2003	686.2	75.5	761.7	560.4	227.0	787.4
2004	712.3	79.8	792.1	583.1	240.1	823.2
2005	739.4	84.2	823.6	606.8	253.8	860.6
2006	767.6	88.9	856.5	631.4	267.8	899.2
2007	796.8	93.6	890.4	657.0	282.5	939.5
2008	827.1	98.5	925.6	683.7	297.6	981.3

Source: BTS Form 41, U.S. Department of Transportation

TABLE 13

UNITED STATES COMMERCIAL AIR CARRIERS

SCHEDULED INTERNATIONAL PASSENGER TRAFFIC

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (MIL)				REVENUE PASSENGER MILES (BIL)			
	ATLANTIC	LATIN AMERICA	PACIFIC	TOTAL	ATLANTIC	LATIN AMERICA	PACIFIC	TOTAL
Historical*								
1991	12.2	14.7	12.8	39.7	47.1	18.3	48.1	113.5
1992	14.8	13.6	14.2	42.6	57.7	17.1	53.6	128.5
1993	15.7	15.8	13.6	45.2	61.5	20.8	52.4	134.8
1994	16.5	16.5	13.4	46.3	64.2	22.0	52.4	138.6
1995	16.2	18.0	14.3	48.6	64.4	24.4	55.5	144.3
1996E	15.8	19.2	15.3	50.3	64.7	26.6	59.7	151.1
Forecast								
1997	16.2	20.7	16.2	53.1	66.7	28.9	63.8	159.4
1998	16.6	22.2	17.3	56.1	68.7	31.3	68.3	168.3
1999	17.2	23.6	18.4	59.2	71.4	33.4	73.1	177.9
2000	18.0	25.0	19.6	62.6	74.9	35.4	77.9	188.2
2001	18.9	26.6	21.0	66.5	78.6	37.8	83.8	200.2
2002	19.8	28.4	22.6	70.8	82.5	40.6	90.2	213.3
2003	20.8	30.4	24.3	75.5	86.5	43.5	97.0	227.0
2004	21.7	32.3	25.8	79.8	90.5	46.4	103.2	240.1
2005	22.6	34.2	27.4	84.2	94.6	49.4	109.8	253.8
2006	23.6	36.2	29.1	88.9	98.8	52.4	116.6	267.8
2007	24.6	38.2	30.8	93.6	103.2	55.5	123.8	282.5
2008	25.7	40.2	32.6	98.5	107.7	58.7	131.2	297.6

Source: BTS Form 41, U.S. Department of Transportation

TABLE 14

UNITED STATES COMMERCIAL AIR CARRIERS

SCHEDULED PASSENGER CAPACITY, TRAFFIC AND LOAD FACTORS

FISCAL YEAR	DOMESTIC			INTERNATIONAL		
	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR
Historical*						
1991	548.4	333.6	60.8	169.3	113.5	67.0
1992	554.1	346.7	62.6	191.6	128.5	67.1
1993	568.8	348.6	61.3	199.5	134.8	67.6
1994	578.1	371.4	64.2	197.9	138.6	70.0
1995	602.0	392.5	65.2	202.3	144.3	71.4
1996E	620.5	418.6	67.5	207.2	151.1	72.9
Forecast						
1997	641.6	439.5	68.5	218.0	159.4	73.1
1998	665.6	459.3	69.0	230.6	168.3	73.0
1999	697.7	477.9	68.5	244.1	177.9	72.9
2000	731.3	497.3	68.0	258.3	188.2	72.9
2001	761.0	517.5	68.0	276.2	200.2	72.5
2002	791.9	538.5	68.0	294.4	213.3	72.5
2003	824.0	560.4	68.0	313.3	227.0	72.5
2004	857.5	583.1	68.0	331.6	240.1	72.4
2005	892.3	606.8	68.0	350.5	253.8	72.4
2006	928.5	631.4	68.0	369.9	267.8	72.4
2007	966.2	657.0	68.0	390.3	282.5	72.4
2008	1005.4	683.7	68.0	411.2	297.6	72.4

Source: BTS Form 41, U.S. Department of Transportation

TABLE 15

UNITED STATES COMMERCIAL AIR CARRIERS

SCHEDULED PASSENGER CAPACITY, TRAFFIC AND LOAD FACTORS BY INTERNATIONAL TRAVEL REGIONS

FISCAL YEAR	ATLANTIC			LATIN AMERICA			PACIFIC		
	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR
Historical*									
1991	67.8	47.1	69.5	29.4	18.3	62.3	72.1	48.1	66.7
1992	83.8	57.7	68.9	29.4	17.1	58.3	78.4	53.6	68.4
1993	88.7	61.5	69.4	35.9	20.8	57.9	74.9	52.4	70.1
1994	89.1	64.2	72.1	36.2	22.0	60.9	72.6	52.4	72.1
1995	85.9	64.4	75.0	38.8	24.4	63.0	77.6	55.5	71.5
1996E	84.9	64.7	76.3	42.1	26.6	63.2	80.2	59.7	74.5
Forecast									
1997	87.8	66.7	76.0	45.2	28.9	63.9	85.0	63.8	75.1
1998	91.0	68.7	75.5	48.5	31.3	64.5	91.1	68.3	75.0
1999	95.2	71.4	75.0	51.4	33.4	65.0	97.5	73.1	75.0
2000	99.9	74.9	75.0	54.5	35.4	65.0	103.9	77.9	75.0
2001	104.8	78.6	75.0	58.2	37.8	64.9	113.2	83.8	74.0
2002	110.0	82.5	75.0	62.5	40.6	65.0	121.9	90.2	74.0
2003	115.3	86.5	75.0	66.9	43.5	65.0	131.1	97.0	74.0
2004	120.7	90.5	75.0	71.4	46.4	65.0	139.5	103.2	74.0
2005	126.1	94.6	75.0	76.0	49.4	65.0	148.4	109.8	74.0
2006	131.7	98.8	75.0	80.6	52.4	65.0	157.6	116.6	74.0
2007	137.6	103.2	75.0	85.4	55.5	65.0	167.3	123.8	74.0
2008	143.6	107.7	75.0	90.3	58.7	65.0	177.3	131.2	74.0

Source: BTS Form 41, U.S. Department of Transportation

TABLE 16

UNITED STATES COMMERCIAL AIR CARRIERS

LARGE JET AIRCRAFT

AS OF	NARROWBODY			WIDEBODY			
JANUARY 1	2 ENGINE	3 ENGINE	4 ENGINE	2 ENGINE	3 ENGINE	4 ENGINE	TOTAL
Historical*							
1991	2,113	1,194	246	210	290	191	4,244
1992	2,178	1,091	202	221	309	201	4,202
1993	2,328	988	203	239	330	166	4,254
1994	2,529	931	213	263	315	170	4,421
1995	2,756	876	234	269	294	176	4,605
1996E	2,889	854	247	296	312	177	4,775
Forecast							
1997	2,996	843	248	332	317	180	4,916
1998	3,098	835	249	372	337	178	5,069
1999	3,233	795	238	416	337	178	5,197
2000	3,389	751	214	441	339	180	5,314
2001	3,617	752	218	470	324	179	5,560
2002	3,835	752	222	507	301	179	5,796
2003	4,042	734	226	557	287	181	6,027
2004	4,251	719	229	603	294	185	6,281
2005	4,448	694	231	649	299	187	6,508
2006	4,663	670	236	694	308	191	6,762
2007	4,862	645	238	734	315	193	6,987
2008	5,075	615	241	778	321	196	7,226

TABLE 17

UNITED STATES COMMERCIAL AIR CARRIERS

TOTAL AIRBORNE HOURS

(In Thousands)

FISCAL YEAR	NARROWBODY			WIDEBODY			TOTAL
	2 ENGINE	3 ENGINE	4 ENGINE	2 ENGINE	3 ENGINE	4 ENGINE	
Historical*							
1991	5,598	2,274	357	745	921	659	10,554
1992	5,999	2,046	248	827	1,022	586	10,728
1993	6,491	1,900	287	934	1,057	537	11,206
1994	7,089	1,687	286	960	981	535	11,538
1995	7,649	1,583	312	980	938	558	12,020
1996E	8,042	1,481	312	1,010	943	554	12,342
Forecast							
1997	8,296	1,433	310	1,132	957	562	12,690
1998	8,517	1,378	309	1,269	1,014	555	13,042
1999	8,823	1,272	295	1,419	1,011	555	13,375
2000	9,252	1,202	265	1,504	1,017	562	13,802
2001	9,874	1,166	270	1,603	972	558	14,443
2002	10,470	1,166	275	1,729	903	558	15,101
2003	11,035	1,138	280	1,899	861	565	15,778
2004	11,605	1,114	284	2,056	882	577	16,518
2005	12,143	1,076	286	2,213	897	583	17,198
2006	12,730	1,039	292	2,367	924	596	17,948
2007	13,273	999	295	2,503	945	602	18,617
2008	13,855	953	299	2,653	963	612	19,335

Source: BTS Form 41, U.S. Department of Transportation

TABLE 18

TOTAL JET FUEL AND AVIATION GASOLINE FUEL CONSUMPTION

UNITED STATES CIVIL AVIATION AIRCRAFT

(Millions of Gallons)

FISCAL YEAR	JET FUEL					AVIATION GASOLINE			TOTAL FUEL CONSUMED
	U.S. AIR CARRIERS			GENERAL AVIATION	TOTAL	AIR CARRIER	GENERAL AVIATION	TOTAL	
	DOMESTIC	INT'L.	TOTAL						
Historical*									
1991	11,657	3,998	15,655	577	16,232	2	354	356	16,588
1992	11,704	4,065	15,769	494	16,263	2	314	316	16,579
1993	11,899	4,109	16,008	454	16,462	2	268	270	16,732
1994	12,202	4,227	16,429	471	16,900	2	264	266	17,166
1995	12,652	4,417	17,069	469	17,538	2	258	260	17,798
1996E	13,022	4,557	17,579	544	18,123	2	276	278	18,401
Forecast									
1997	13,395	4,763	18,158	543	18,701	2	277	279	18,980
1998	13,838	5,005	18,843	556	19,399	2	281	283	19,682
1999	14,445	5,264	19,709	560	20,269	2	283	285	20,554
2000	15,078	5,534	20,612	569	21,181	2	287	289	21,470
2001	15,626	5,880	21,506	576	22,082	2	290	292	22,374
2002	16,194	6,228	22,422	576	22,998	2	292	294	23,292
2003	16,782	6,586	23,368	600	23,968	2	293	295	24,263
2004	17,394	6,927	24,321	607	24,928	2	295	297	25,225
2005	18,026	7,276	25,302	617	25,919	2	297	299	26,218
2006	18,682	7,631	26,313	631	26,944	2	299	301	27,245
2007	19,363	8,002	27,365	644	28,009	2	301	303	28,312
2008	20,148	8,379	28,527	650	29,177	2	302	304	29,481

* Source: Air carrier jet fuel, BTS Form 41; All others, FAA APO estimates

TABLE 19

BASELINE REGIONALS/COMMUTERS FORECAST ASSUMPTIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH		AVERAGE PASSENGER LOAD FACTOR (Percent)
		48 STATES (Miles)	HA/P.R./V.I. (Miles)	
Historical*				
1991	26.5	185.7	82.0	47.1
1992	27.5	196.9	85.8	48.6
1993	27.6	204.2	88.6	48.8
1994	28.5	212.6	90.1	50.7
1995	29.3	220.1	100.6	49.5
1996E	30.5	228.2	105.3	52.1
Forecast				
1997	31.2	231.9	105.4	52.5
1998	31.8	236.2	105.4	52.9
1999	32.4	240.1	105.5	53.3
2000	33.0	244.3	105.6	53.6
2001	33.6	248.2	105.7	54.0
2002	34.2	252.0	105.8	54.4
2003	34.9	256.2	105.9	54.7
2004	35.5	260.1	106.0	55.1
2005	36.1	264.3	106.1	55.5
2006	36.8	268.2	106.2	55.9
2007	37.4	272.4	106.3	56.2
2008	38.1	276.3	106.4	56.6

* Source: BTS Form's 298-C and 41, U.S. Department of Transportation

TABLE 20

UNITED STATES REGIONALS/COMMUTERS

SCHEDULED PASSENGER TRAFFIC

(In Millions)

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS			REVENUE PASSENGER MILES		
	48 STATES	HAWAII/ PUERTO RICO/ VIRGIN ISLANDS	TOTAL	48 STATES	HAWAII/ PUERTO RICO/ VIRGIN ISLANDS	TOTAL
Historical*						
1991	37.0	1.7	38.7	6,870.1	139.4	7,009.5
1992	41.1	1.6	42.7	8,091.7	137.2	8,228.9
1993	45.1	1.6	46.7	9,208.5	141.7	9,350.2
1994	51.5	1.7	53.2	10,948.0	153.2	11,101.2
1995	51.1	2.1	53.2	11,247.9	207.3	11,455.2
1996E	55.2	2.3	57.5	12,599.2	246.5	12,845.7
Forecast						
1997	60.1	2.4	62.5	13,937.2	257.3	14,194.5
1998	63.4	2.5	65.9	14,975.1	261.6	15,236.7
1999	67.0	2.5	69.5	16,086.7	266.2	16,352.9
2000	70.8	2.6	73.4	17,296.4	270.8	17,567.2
2001	74.7	2.6	77.3	18,540.5	275.3	18,815.8
2002	78.7	2.6	81.3	19,832.4	279.9	20,112.3
2003	82.5	2.7	85.2	21,136.5	284.6	21,421.1
2004	86.6	2.7	89.3	22,524.7	289.2	22,813.9
2005	90.7	2.8	93.5	23,972.0	293.8	24,265.8
2006	95.0	2.8	97.8	25,479.0	298.4	25,777.4
2007	99.4	2.9	102.3	27,076.6	303.2	27,379.8
2008	104.0	2.9	106.9	28,735.2	307.8	29,043.0

* Source: BTS Form's 298-C and 41, U.S. Department of Transportation

TABLE 21

UNITED STATES REGIONALS/COMMUTERS

PASSENGER AIRCRAFT AND FLIGHT HOURS

AS OF JANUARY 1	REGIONAL/COMMUTER AIRCRAFT					FLIGHT HOURS (000)
	LESS THAN 15 SEATS	15 TO 19 SEATS	20 TO 40 SEATS	MORE THAN 40 SEATS	TOTAL	
Historical						
1991	535	762	445	154	1,896	2,720
1992	534	735	503	188	1,960	2,837
1993	530	752	585	187	2,054	2,950
1994	581	763	626	209	2,179	2,990
1995	565	710	644	213	2,132	2,808
1996E	560	656	661	213	2,090	2,413
Forecast						
1997	549	646	697	256	2,148	2,776
1998	524	638	755	300	2,217	2,840
1999	497	630	810	345	2,282	2,902
2000	471	622	867	393	2,353	2,966
2001	447	615	926	442	2,430	3,025
2002	428	608	979	492	2,507	3,086
2003	411	601	1,031	543	2,586	3,145
2004	395	594	1,076	592	2,657	3,204
2005	380	587	1,122	637	2,726	3,265
2006	367	580	1,164	680	2,791	3,324
2007	356	573	1,204	718	2,851	3,384
2008	346	566	1244	753	2,909	3,445

Source: Fleet, FAA Aircraft Utilization and Propulsion Reliability Report
Flight Hours BTS Form 298-C, U.S. Department of Transportation

TABLE 22

ACTIVE GENERAL AVIATION AND AIR TAXI AIRCRAFT

(In Thousands)

AS OF JANUARY 1	FIXED WING				ROTORCRAFT		EXPERI-MENTAL	OTHER	TOTAL
	PISTON								
	SINGLE ENGINE	MULTI-ENGINE	TURBOPROP	TURBO JET	PISTON	TURBINE			
Historical*									
1991	154.0	21.2	5.3	4.1	3.2	3.7	N.A.	6.6	198.0
1992	154.1	21.2	4.9	4.4	2.5	3.8	N.A.	7.6	198.5
1993	143.6	18.6	4.7	4.0	2.2	3.5	N.A.	7.8	184.4
1994	130.7	16.4	4.4	3.9	1.6	2.9	11.0	5.2	176.0
1995	123.3	15.6	4.2	4.1	1.4	3.0	12.9	6.2	170.6
1996	128.8	16.6	4.5	4.6	1.5	3.6	16.4	5.3	181.3
Forecast									
1997	129.0	16.6	4.5	4.7	1.5	3.6	16.6	5.3	181.8
1998	130.7	16.7	4.6	4.8	1.5	3.6	16.8	5.4	184.1
1999	132.0	16.8	4.6	4.8	1.4	3.6	17.0	5.4	185.6
2000	133.4	16.9	4.7	4.9	1.4	3.6	17.2	5.5	187.6
2001	134.7	17.0	4.8	4.9	1.4	3.6	17.3	5.5	189.2
2002	135.4	17.0	4.8	5.0	1.4	3.6	17.5	5.6	190.3
2003	136.1	17.1	4.9	5.1	1.3	3.6	17.7	5.6	191.4
2004	136.7	17.2	5.0	5.1	1.3	3.6	17.8	5.7	192.4
2005	137.4	17.2	5.0	5.2	1.3	3.6	18.0	5.7	193.4
2006	138.1	17.3	5.1	5.3	1.3	3.6	18.1	5.8	194.6
2007	138.8	17.4	5.1	5.4	1.2	3.6	18.3	5.8	195.6
2008	139.5	17.4	5.2	5.4	1.2	3.6	18.4	5.9	196.6

* Source: FAA General Aviation and Air Taxi Activity (and Avionics) Surveys

Notes: An active aircraft is one that has a current registration and was flown at least one hour during the previous calendar year.
Experimental aircraft included in the survey for the first time in 1994.

TABLE 23

ACTIVE GENERAL AVIATION AND AIR TAXI AIRCRAFT

BY FAA REGION

(In Thousands)

AS OF JANUARY 1	FAA REGION									TOTAL AIRCRAFT
	NEW ENGLAND	EASTERN	SOUTHERN	GREAT LAKES	CENTRAL	SOUTHWEST	WESTERN PACIFIC	NORTHWEST MOUNTAIN	ALASKA	
Historical*										
1991	8.1	23.1	32.9	34.8	11.0	26.4	34.9	20.3	6.5	198.0
1992	8.3	22.5	32.4	34.8	11.4	26.5	36.5	19.4	6.6	198.5
1993	7.3	21.7	30.8	32.9	10.3	24.9	31.4	19.2	6.1	184.4
1994	7.1	21.2	28.5	32.4	10.5	22.9	29.6	18.3	5.4	176.0
1995	6.6	20.4	28.7	30.9	9.4	23.5	28.2	17.4	5.5	170.6
1996E	6.7	21.5	30.0	33.2	10.3	24.4	29.5	20.3	5.3	181.2
Forecast										
1997	7.1	21.8	30.6	32.9	9.9	25.1	30.3	18.4	5.7	181.8
1998	7.3	22.0	31.0	33.3	10.1	25.5	30.7	18.5	5.7	184.1
1999	7.3	22.2	31.2	33.5	10.2	25.8	31.2	18.5	5.7	185.6
2000	7.4	22.3	31.5	33.8	10.3	26.1	31.8	18.6	5.8	187.6
2001	7.4	22.5	31.9	34.1	10.3	26.3	32.3	18.6	5.8	189.2
2002	7.4	22.6	32.1	34.4	10.4	26.4	32.6	18.6	5.8	190.3
2003	7.5	22.7	32.2	34.6	10.4	26.6	32.9	18.7	5.8	191.4
2004	7.5	22.8	32.4	34.7	10.5	26.8	33.2	18.7	5.8	192.4
2005	7.5	23.0	32.6	34.9	10.5	27.0	33.4	18.7	5.8	193.4
2006	7.5	23.1	32.8	35.1	10.5	27.2	33.7	18.8	5.9	194.6
2007	7.5	23.2	33.0	35.4	10.5	27.3	34.0	18.8	5.9	195.6
2008	7.5	23.4	33.2	35.6	10.5	27.5	34.2	18.8	5.9	196.6

*Source: FAA Statistical Handbook of Aviation.

Notes: Commuters are included in the historical fleet data prior to 1994, excluded thereafter.

TABLE 24

ACTIVE GENERAL AVIATION AND AIR TAXI HOURS FLOWN

(In Millions)

CALENDAR YEAR	FIXED WING				ROTORCRAFT		EXPERI-MENTAL	OTHER	TOTAL
	PISTON								
	SINGLE ENGINE	MULTI-ENGINE	TURBOPROP	TURBOJET	PISTON	TURBINE			
Historical*									
1991	20.5	3.6	1.5	1.2	0.6	2.2	N.A.	0.5	30.1
1992	18.1	3.2	1.5	1.1	0.4	1.9	N.A	0.4	26.5
1993	16.5	2.5	1.2	1.2	0.4	1.5	0.7	0.4	24.3
1994	15.8	2.6	1.1	1.2	0.3	1.7	0.7	0.4	23.9
1995	16.2	2.6	1.4	1.4	0.3	2.0	1.2	0.3	25.4
1996E	16.3	2.6	1.4	1.5	0.3	2.0	1.2	0.3	25.6
Forecast									
1997	16.5	2.6	1.4	1.5	0.3	2.0	1.2	0.3	25.8
1998	16.7	2.7	1.4	1.6	0.3	2.0	1.3	0.3	26.3
1999	16.9	2.7	1.5	1.6	0.3	2.0	1.3	0.3	26.6
2000	17.1	2.7	1.5	1.7	0.3	2.0	1.3	0.3	26.9
2001	17.3	2.7	1.5	1.7	0.3	2.1	1.3	0.3	27.2
2002	17.5	2.7	1.6	1.8	0.3	2.1	1.3	0.3	27.6
2003	17.6	2.8	1.6	1.8	0.3	2.1	1.3	0.4	27.9
2004	17.7	2.8	1.6	1.8	0.3	2.1	1.3	0.4	28.0
2005	17.8	2.8	1.6	1.9	0.3	2.2	1.4	0.4	28.4
2006	17.9	2.8	1.6	1.9	0.3	2.2	1.4	0.4	28.5
2007	18.0	2.8	1.7	2.0	0.3	2.2	1.4	0.4	28.8
2008	18.1	2.8	1.7	2.0	0.3	2.2	1.4	0.4	28.9

* Source: FAA General Aviation and Air Taxi Surveys

Notes: An active aircraft is one that has a current registration and was flown at least one hour during the previous calendar year.
Experimental aircraft included in the survey for the first time in 1994.

TABLE 25

ACTIVE PILOTS BY TYPE OF CERTIFICATE

(In Thousands)

AS OF JANUARY 1	STUDENTS	REC./1 LIGHTER-THAN-AIR2/	PRIVATE	COMMERCIAL	AIRLINE TRANSPORT	HELOCOPTER ONLY	GLIDER ONLY	TOTAL	INSTRUMENT RATED3/
Historical*									
1991	128.7	0.1	299.1	149.7	107.7	9.6	7.8	702.7	297.1
1992	120.2	0.2	293.3	148.4	112.2	9.9	8.0	692.2	303.2
1993	114.6	0.2	288.1	146.4	115.9	9.7	8.2	683.1	306.2
1994	103.6	0.2	283.7	143.0	117.1	9.2	8.3	665.1	305.5
1995	96.3	0.2	284.2	138.7	117.4	8.7	8.5	654.0	302.3
1996	101.3	0.2	261.4	134.0	123.9	7.2	11.2	639.2	298.8
Forecast									
1997	101.3	0.2	261.4	132.6	126.4	7.2	11.2	640.3	299.9
1998	102.8	0.3	264.0	133.9	128.9	7.1	11.2	648.2	307.5
1999	104.6	0.3	266.7	135.3	131.1	7.2	11.3	656.5	310.5
2000	106.7	0.3	269.3	136.6	133.4	7.3	11.3	664.9	314.6
2001	108.8	0.3	272.0	137.6	135.3	7.4	11.4	672.8	315.7
2002	110.5	0.4	274.1	138.6	137.4	7.4	11.4	679.8	319.0
2003	112.2	0.4	276.1	139.3	139.4	7.5	11.5	686.4	320.9
2004	113.6	0.4	278.2	140.0	141.2	7.5	11.5	692.4	323.3
2005	114.7	0.4	279.8	140.7	143.0	7.6	11.6	697.8	325.8
2006	115.5	0.5	281.2	141.4	145.0	7.6	11.6	702.8	328.3
2007	116.4	0.5	282.7	142.1	146.7	7.7	11.7	707.8	316.2
2008	117.2	0.5	284.1	142.8	148.6	7.7	11.7	712.6	318.4

* Source: FAA Statistical Handbook of Aviation.

1/ Recreational rating not available until 1991.

2/ Lighter-than-air type rating is no longer issued after 1990.

3/ Instrument rated pilots should not be added to other categories in deriving total.

Notes: An active pilot is a person with a pilot certificate and a valid medical certificate.

TABLE 26

GENERAL AVIATION AIRCRAFT FUEL CONSUMPTION

(In Millions of Gallons)

CALENDAR YEAR	FIXED WING				ROTORCRAFT		OTHER/ EXPERI- MENTAL	TOTAL FUEL CONSUMED
	PISTON							
	SINGLE ENGINE	MULTI-ENGINE	TURBOPROP	TURBOJET	PISTON	TURBINE		
Historical*								
1991	230.8	110.3	133.3	351.1	7.7	92.4	4.8	930.4
1992	202.2	98.9	124.3	289.0	6.5	80.6	6.5	808.0
1993	178.7	74.7	99.9	310.6	5.6	43.5	9.4	722.4
1994	170.7	78.8	89.8	331.0	5.1	50.0	9.5	734.9
1995	167.5	75.8	89.8	331.0	5.1	48.5	9.7	727.4
1996	175.9	79.4	111.6	372.7	5.2	59.5	15.3	819.6
Forecast								
1997	176.7	79.7	112.1	371.1	5.2	59.5	15.5	819.7
1998	179.4	80.2	114.5	381.8	5.2	59.7	15.7	836.5
1999	181.7	80.6	114.8	385.5	5.2	59.9	15.9	843.7
2000	184.5	81.1	117.0	391.4	5.2	60.2	16.0	855.4
2001	186.7	81.6	119.5	395.7	5.2	60.4	16.1	865.2
2002	188.2	81.8	119.8	395.5	5.2	60.6	16.3	867.4
2003	189.6	82.1	122.0	416.6	5.2	60.8	16.5	892.9
2004	190.9	82.6	124.5	421.1	5.2	61.1	16.6	902.0
2005	192.4	82.8	124.8	431.3	5.2	61.3	16.8	914.5
2006	193.8	83.0	127.0	442.7	5.2	61.5	16.9	930.1
2007	195.3	83.5	127.3	454.6	5.2	61.7	17.1	944.8
2008	196.3	83.7	129.5	458.4	5.2	62.0	17.2	952.2

Source: FAA APO Estimates

* Adjusted to reflect nonrespondent sampling error.

Notes: Detail may not add to total because of independent rounding.

TABLE 27

ACTIVE ROTORCRAFT FLEET AND HOURS FLOWN

AS OF JANUARY 1	ACTIVE FLEET (Thousands)			CALENDAR YEAR	HOURS FLOWN (Millions)		
	PISTON	TURBINE	TOTAL		PISTON	TURBINE	TOTAL
Historical*				Historical*			
1991	3.2	3.7	6.9	1991	0.6	2.2	2.8
1992	2.5	3.8	6.3	1992	0.4	1.9	2.3
1993	2.2	3.5	5.7	1993	0.4	1.5	1.9
1994	1.6	2.9	4.5	1994	0.3	1.7	2.0
1995	1.4	3.0	4.4	1995	0.3	2.0	2.3
1996	1.5	3.6	5.1	1996E	0.3	2.0	2.3
Forecast				Forecast			
1997	1.5	3.6	5.1	1997	0.3	2.0	2.3
1998	1.5	3.6	5.1	1998	0.3	2.0	2.3
1999	1.4	3.6	5.0	1999	0.3	2.0	2.3
2000	1.4	3.6	5.0	2000	0.3	2.0	2.3
2001	1.4	3.6	5.0	2001	0.3	2.1	2.4
2002	1.4	3.6	5.0	2002	0.3	2.1	2.4
2003	1.3	3.6	4.9	2003	0.3	2.1	2.4
2004	1.3	3.6	4.9	2004	0.3	2.1	2.4
2005	1.3	3.6	4.9	2005	0.3	2.2	2.5
2006	1.3	3.6	4.9	2006	0.3	2.2	2.5
2007	1.2	3.6	4.8	2007	0.3	2.2	2.5
2008	1.2	3.6	4.8	2008	0.3	2.2	2.5

* Source: FAA General Aviation and Air Taxi Activity (and Avionics) Surveys
(1) Hours flown data is for the entire calendar year.

TABLE 28

TOTAL COMBINED AIRCRAFT OPERATIONS AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL	NUMBER OF TOWERS**	
						FAA	CONTRACT
Historical*							
1991	12.5	9.0	38.8	2.3	62.6	399	26
1992	12.4	9.5	38.4	2.4	62.7	401	27
1993	12.6	9.9	36.7	2.3	61.5	401	27
1994	13.2	10.2	36.3	2.3	62.0	402	32
1995	13.7	10.2	36.0	2.6	62.5	352	94
1996E	13.9	10.1	35.2	2.6	61.8	315	128
Forecast							
1997	14.3	10.4	35.5	2.5	62.7	290	153
1998	14.6	10.6	35.8	2.4	63.4	275	168
1999	15.0	10.8	35.9	2.4	64.1	275	168
2000	15.4	11.1	36.4	2.4	65.3	275	168
2001	15.8	11.3	36.6	2.4	66.1	275	168
2002	16.2	11.5	36.7	2.4	66.8	275	168
2003	16.6	11.7	37.0	2.4	67.7	275	168
2004	16.9	12.0	37.3	2.4	68.6	275	168
2005	17.3	12.2	37.5	2.4	69.4	275	168
2006	17.8	12.4	37.8	2.4	70.4	275	168
2007	18.2	12.6	38.1	2.4	71.3	275	168
2008	18.6	12.9	38.4	2.4	72.3	275	168

* Source: FAA Air Traffic Activity.

** Total number at end of the fiscal year (September 30)

TABLE 29

COMBINED ITINERANT AIRCRAFT OPERATIONS AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1991	12.5	9.0	22.2	1.1	44.8
1992	12.4	9.5	22.1	1.0	45.0
1993	12.6	9.9	21.2	1.0	44.7
1994	13.2	10.2	21.1	1.0	45.5
1995	13.7	10.2	20.9	1.3	46.1
1996E	13.9	10.1	20.8	1.3	46.1
Forecast					
1997	14.3	10.4	20.9	1.3	46.9
1998	14.6	10.6	21.1	1.3	47.6
1999	15.0	10.8	21.2	1.3	48.3
2000	15.4	11.1	21.5	1.3	49.3
2001	15.8	11.3	21.6	1.3	50.0
2002	16.2	11.5	21.7	1.3	50.7
2003	16.6	11.7	21.8	1.3	51.4
2004	16.9	12.0	22.1	1.3	52.3
2005	17.3	12.2	22.2	1.3	53.0
2006	17.8	12.4	22.3	1.3	53.8
2007	18.2	12.6	22.6	1.3	54.7
2008	18.6	12.9	22.7	1.3	55.5

* Source: FAA Air Traffic Activity.

TABLE 30

COMBINED LOCAL AIRCRAFT OPERATIONS AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	GENERAL AVIATION	MILITARY	TOTAL
Historical*			
1991	16.6	1.2	17.8
1992	16.3	1.4	17.7
1993	15.5	1.3	16.8
1994	15.2	1.3	16.5
1995	15.1	1.3	16.4
1996E	14.4	1.3	15.7
Forecast			
1997	14.6	1.2	15.8
1998	14.7	1.1	15.8
1999	14.7	1.1	15.8
2000	14.9	1.1	16.0
2001	15.0	1.1	16.1
2002	15.0	1.1	16.1
2003	15.2	1.1	16.3
2004	15.2	1.1	16.3
2005	15.3	1.1	16.4
2006	15.5	1.1	16.6
2007	15.5	1.1	16.6
2008	15.7	1.1	16.8

* Source: FAA Air Traffic Activity.

TABLE 31

TOTAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1991	12.5	8.9	37.5	2.2	61.1
1992	12.4	9.3	37.0	2.3	61.0
1993	12.6	9.7	35.3	2.2	59.8
1994	13.2	10.0	34.7	2.2	60.1
1995	13.6	9.8	32.3	2.3	58.0
1996E	13.8	9.3	29.2	2.1	54.4
Forecast					
1997	14.1	9.2	27.5	2.0	52.8
1998	14.4	9.2	26.7	1.8	52.1
1999	14.8	9.3	26.2	1.8	52.1
2000	15.2	9.5	26.5	1.8	53.0
2001	15.6	9.7	26.7	1.8	53.8
2002	16.0	9.9	26.8	1.8	54.5
2003	16.4	10.1	27.0	1.8	55.3
2004	16.7	10.3	27.2	1.8	56.0
2005	17.1	10.5	27.4	1.8	56.8
2006	17.6	10.7	27.6	1.8	57.7
2007	18.0	10.9	27.8	1.8	58.5
2008	18.4	11.1	28.0	1.8	59.3

* Source: FAA Air Traffic Activity.

TABLE 32

ITINERANT AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1991	12.5	8.9	21.5	1.0	43.9
1992	12.4	9.3	21.3	1.0	44.0
1993	12.6	9.7	20.4	1.0	43.7
1994	13.2	10.0	20.2	1.0	44.4
1995	13.6	9.8	18.9	1.2	43.5
1996E	13.8	9.3	17.6	1.1	41.7
Forecast					
1997	14.1	9.2	16.6	1.1	41.0
1998	14.4	9.2	16.2	1.0	40.8
1999	14.8	9.3	16.0	1.0	41.1
2000	15.2	9.5	16.2	1.0	41.9
2001	15.6	9.7	16.3	1.0	42.6
2002	16.0	9.9	16.4	1.0	43.3
2003	16.4	10.1	16.5	1.0	44.0
2004	16.7	10.3	16.7	1.0	44.7
2005	17.1	10.5	16.8	1.0	45.4
2006	17.6	10.7	16.9	1.0	46.2
2007	18.0	10.9	17.1	1.0	47.0
2008	18.4	11.1	17.2	1.0	47.7

* Source: FAA Air Traffic Activity.

TABLE 33

LOCAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	GENERAL AVIATION	MILITARY	TOTAL
Historical*			
1991	16.0	1.2	17.2
1992	15.7	1.3	17.0
1993	14.9	1.2	16.1
1994	14.5	1.2	15.7
1995	13.4	1.1	14.5
1996E	11.7	1.0	12.7
Forecast			
1997	10.9	0.9	11.8
1998	10.5	0.8	11.3
1999	10.2	0.8	11.0
2000	10.3	0.8	11.1
2001	10.4	0.8	11.2
2002	10.4	0.8	11.2
2003	10.5	0.8	11.3
2004	10.5	0.8	11.3
2005	10.6	0.8	11.4
2006	10.7	0.8	11.5
2007	10.7	0.8	11.5
2008	10.8	0.8	11.6

* Source: FAA Air Traffic Activity.

TABLE 34

TOTAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1991	6.1	143.3	1,332.6	78.4	1,560.4
1992	9.0	154.7	1,409.4	93.9	1,667.0
1993	13.7	155.9	1,373.2	105.2	1,648.0
1994	13.5	167.1	1,561.2	142.7	1,884.5
1995	57.7	410.4	3,658.2	316.5	4,442.8
1996E	130.3	853.4	5,998.9	467.1	7,449.7
Forecast					
1997	155.0	1,150.0	7,998.0	547.0	9,850.0
1998	188.0	1,390.0	9,136.0	617.0	11,331.0
1999	207.0	1,527.0	9,745.0	642.0	12,121.0
2000	211.0	1,553.0	9,812.0	642.0	12,218.0
2001	215.0	1,580.0	9,881.0	642.0	12,318.0
2002	220.0	1,607.0	9,948.0	642.0	12,417.0
2003	224.0	1,634.0	10,017.0	642.0	12,517.0
2004	228.0	1,662.0	10,087.0	642.0	12,619.0
2005	233.0	1,690.0	10,157.0	642.0	12,722.0
2006	238.0	1,719.0	10,227.0	642.0	12,826.0
2007	242.0	1,748.0	10,299.0	642.0	12,931.0
2008	247.0	1,778.0	10,370.0	642.0	13,037.0

* Source: FAA Air Traffic Activity.

** Total for 352 towered airports.

Notes: Detail may not add to total because of rounding.

TABLE 35

ITINERANT AIRCRAFT OPERATIONS

AT AIRPORTS WITH CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1991	6.1	143.3	747.3	32.9	929.6
1992	9.0	154.7	767.1	38.6	969.4
1993	13.7	155.9	759.9	43.4	972.9
1994	13.5	167.1	854.8	49.6	1,085.0
1995	57.7	410.4	1,974.0	141.1	2,583.2
1996E	130.3	853.4	3,219.7	210.7	4,414.1
Forecast					
1997	155.0	1,150.0	4,301.0	248.0	5,854.0
1998	188.0	1,390.0	4,901.0	277.0	6,756.0
1999	207.0	1,527.0	5,220.0	293.0	7,247.0
2000	211.0	1,553.0	5,251.0	293.0	7,308.0
2001	215.0	1,580.0	5,283.0	293.0	7,371.0
2002	220.0	1,607.0	5,314.0	293.0	7,434.0
2003	224.0	1,634.0	5,346.0	293.0	7,497.0
2004	228.0	1,662.0	5,378.0	293.0	7,561.0
2005	233.0	1,690.0	5,411.0	293.0	7,627.0
2006	238.0	1,719.0	5,443.0	293.0	7,693.0
2007	242.0	1,748.0	5,476.0	293.0	7,759.0
2008	247.0	1,778.0	5,509.0	293.0	7,827.0

* Source: FAA Air Traffic Activity.

TABLE 36

LOCAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	GENERAL AVIATION	MILITARY	TOTAL
Historical*			
1991	585.3	45.5	630.8
1992	642.3	55.3	697.6
1993	613.3	61.8	675.1
1994	706.4	93.1	799.5
1995	1,684.2	175.4	1,859.6
1996E	2,779.2	256.4	3,035.6
Forecast			
1997	3,697.0	299.0	3,996.0
1998	4,235.0	340.0	4,575.0
1999	4,525.0	349.0	4,874.0
2000	4,561.0	349.0	4,910.0
2001	4,598.0	349.0	4,947.0
2002	4,634.0	349.0	4,983.0
2003	4,671.0	349.0	5,020.0
2004	4,709.0	349.0	5,058.0
2005	4,746.0	349.0	5,095.0
2006	4,784.0	349.0	5,133.0
2007	4,823.0	349.0	5,172.0
2008	4,861.0	349.0	5,210.0

* Source: FAA Air Traffic Activity.

TABLE 37

TOTAL COMBINED INSTRUMENT OPERATIONS

AT AIRPORTS WITH FAA AND CONTRACT TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1991	13.5	9.6	18.2	4.0	45.2
1992	13.4	10.0	18.3	4.1	45.8
1993	13.6	10.5	17.8	3.9	45.8
1994	14.3	10.9	18.1	3.7	47.0
1995	14.6	11.0	18.2	3.5	47.3
1996E	14.8	10.8	17.9	3.3	46.8
Forecast					
1997	15.2	11.0	18.0	3.2	47.4
1998	15.5	11.3	18.3	3.1	48.2
1999	15.9	11.5	18.4	3.1	48.9
2000	16.4	11.8	18.6	3.1	49.9
2001	16.8	12.1	18.7	3.1	50.7
2002	17.2	12.3	18.9	3.1	51.5
2003	17.6	12.6	19.1	3.1	52.4
2004	18.0	12.8	19.2	3.1	53.1
2005	18.4	13.0	19.4	3.1	53.9
2006	18.9	13.3	19.6	3.1	54.9
2007	19.3	13.6	19.8	3.1	55.8
2008	19.9	13.8	19.9	3.1	56.7

* Source: FAA Air Traffic Activity.

TABLE 38

INSTRUMENT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1991	13.5	9.5	18.1	4.0	45.1
1992	13.4	9.9	18.2	4.1	45.6
1993	13.6	10.4	17.7	3.9	45.6
1994	14.3	10.8	18.0	3.7	46.8
1995	14.6	10.8	18.1	3.5	47.0
1996E	14.7	10.6	17.7	3.3	46.2
Forecast					
1997	15.1	10.7	17.8	3.2	46.8
1998	15.4	10.9	18.0	3.1	47.4
1999	15.8	11.1	18.1	3.1	48.1
2000	16.3	11.4	18.3	3.1	49.1
2001	16.7	11.7	18.4	3.1	49.9
2002	17.1	11.9	18.6	3.1	50.7
2003	17.5	12.2	18.8	3.1	51.6
2004	17.9	12.4	18.9	3.1	52.3
2005	18.3	12.6	19.1	3.1	53.1
2006	18.8	12.9	19.3	3.1	54.1
2007	19.2	13.1	19.5	3.1	54.9
2008	19.7	13.3	19.6	3.1	55.7

* Source: FAA Air Traffic Activity.

TABLE 39

INSTRUMENT OPERATIONS

AT AIRPORTS WITH CONTRACT TRAFFIC CONTROL SERVICE

(In Thousands)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1991	4.3	63.3	57.6	22.8	148.0
1992	7.9	75.0	62.5	18.0	163.4
1993	12.6	69.4	64.0	17.4	163.4
1994	11.3	69.1	69.1	16.4	165.9
1995	26.9	163.1	124.0	25.7	339.7
1996E	82.2	248.4	189.2	39.2	559.0
Forecast					
1997	96.0	316.0	238.0	43.0	693.0
1998	115.0	365.0	265.0	47.0	792.0
1999	126.0	393.0	279.0	49.0	847.0
2000	129.0	400.0	282.0	49.0	860.0
2001	131.0	407.0	284.0	49.0	871.0
2002	134.0	414.0	287.0	49.0	884.0
2003	137.0	421.0	290.0	49.0	897.0
2004	139.0	428.0	292.0	49.0	908.0
2005	142.0	435.0	295.0	49.0	921.0
2006	145.0	443.0	297.0	49.0	934.0
2007	148.0	450.0	300.0	49.0	947.0
2008	151.0	458.0	303.0	49.0	961.0

* Source: FAA Air Traffic Activity.

TABLE 40

IFR AIRCRAFT HANDLED

AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS

(In Millions)

FISCAL YEAR	IFR AIRCRAFT HANDLED				
	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1991	18.2	5.5	7.3	5.1	36.1
1992	18.2	5.8	7.3	5.1	36.5
1993	19.0	6.2	7.4	4.8	37.4
1994	20.0	6.6	7.7	4.6	38.8
1995	20.9	6.9	7.8	4.4	40.0
1996E**	21.9	6.6	7.8	4.0	40.3
Forecast					
1997	22.4	6.9	7.9	3.7	40.9
1998	23.0	7.1	8.1	3.6	41.8
1999	23.6	7.2	8.1	3.6	42.5
2000	24.4	7.4	8.1	3.6	43.5
2001	25.0	7.5	8.3	3.6	44.4
2002	25.4	7.7	8.3	3.6	45.0
2003	26.2	7.8	8.4	3.6	46.0
2004	26.8	8.0	8.6	3.6	47.0
2005	27.4	8.1	8.6	3.6	47.7
2006	28.0	8.3	8.6	3.6	48.5
2007	28.6	8.4	8.8	3.6	49.4
2008	29.2	8.6	8.8	3.6	50.2

* Source: FAA Air Traffic Activity.

**Due to an accounting change In 1996, approximately 360,000 operations at the New York ARTCC were shifted from Air Taxi/Commuter to Air Carrier.

Note: Detail may not add to total because of rounding.

TABLE 41

IFR DEPARTURES AND OVERS

AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS

(In Millions)

FISCAL YEAR	AIR CARRIER		AIR TAXI/COMMUTER		GENERAL AVIATION		MILITARY		TOTAL	
	IFR DEPARTURES	OVERS	IFR DEPARTURES	OVERS	IFR DEPARTURES	OVERS	IFR DEPARTURES	OVERS	IFR DEPARTURES	OVERS
Historical*										
1991	6.2	5.8	2.6	0.4	3.0	1.2	1.7	1.6	13.6	9.0
1992	6.2	5.9	2.7	0.4	3.0	1.2	1.7	1.6	13.7	9.2
1993	6.3	6.3	2.9	0.5	3.1	1.3	1.7	1.4	14.0	9.5
1994	6.7	6.6	3.0	0.6	3.1	1.4	1.6	1.3	14.5	9.9
1995	7.0	6.9	3.1	0.6	3.2	1.4	1.5	1.4	14.9	10.3
1996E	7.2	7.4	3.1	0.5	3.2	1.5	1.3	1.3	14.8	10.7
Forecast										
1997	7.4	7.6	3.2	0.5	3.2	1.5	1.2	1.3	15.0	10.9
1998	7.6	7.8	3.3	0.5	3.3	1.5	1.2	1.2	15.4	11.0
1999	7.8	8.0	3.3	0.6	3.3	1.5	1.2	1.2	15.6	11.3
2000	8.1	8.2	3.4	0.6	3.3	1.5	1.2	1.2	16.0	11.5
2001	8.3	8.4	3.4	0.7	3.4	1.5	1.2	1.2	16.3	11.8
2002	8.4	8.6	3.5	0.7	3.4	1.5	1.2	1.2	16.5	12.0
2003	8.7	8.8	3.5	0.8	3.4	1.6	1.2	1.2	16.8	12.4
2004	8.9	9.0	3.6	0.8	3.5	1.6	1.2	1.2	17.2	12.6
2005	9.1	9.2	3.6	0.9	3.5	1.6	1.2	1.2	17.4	12.9
2006	9.3	9.4	3.7	0.9	3.5	1.6	1.2	1.2	17.7	13.1
2007	9.5	9.6	3.7	1.0	3.6	1.6	1.2	1.2	18.0	13.4
2008	9.7	9.8	3.8	1.0	3.6	1.6	1.2	1.2	18.3	13.6

* Source: FAA Air Traffic Activity.

Note: Totals may not add because of rounding.

TABLE 42

TOTAL FLIGHT SERVICES

AT FAA FLIGHT SERVICE STATIONS

(In Millions)

FISCAL YEAR	FLIGHT PLANS ORIGINATED	PILOT BRIEFS	AIRCRAFT CONTACTED	TOTAL FLIGHT SERVICES	FLIGHT SERVICES INCLUDING DUATS
Historical*					
1991	6.6	11.0	5.8	41.0	47.4
1992	6.4	10.7	5.5	39.7	48.5
1993	6.2	10.0	4.9	37.3	49.5
1994	6.3	9.6	4.7	36.5	52.5
1995	6.3	9.2	4.2	35.2	46.6
1996E	6.4	8.4	3.8	33.4	45.4
Forecast					
1997	6.4	8.2	3.6	32.8	45.4
1998	6.3	8.0	3.4	32.0	45.2
1999	6.2	7.9	3.3	31.5	45.3
2000	6.2	7.8	3.3	31.3	45.7
2001	6.1	7.8	3.3	31.1	46.1
2002	6.1	7.8	3.2	31.0	46.6
2003	6.0	7.8	3.2	30.8	47.0
2004	6.0	7.7	3.2	30.6	47.4
2005	6.0	7.7	3.1	30.5	47.7
2006	5.9	7.7	3.1	30.3	48.1
2007	5.9	7.6	3.1	30.1	48.3
2008	5.9	7.6	3.0	30.0	48.8

* Source: FAA Air Traffic Activity.

Notes: Total flight services is equal to the sum of flight plans originated and pilot briefs, multiplied by two, plus the number of aircraft contacted.

TABLE 43

FLIGHT PLANS ORIGINATED

AT FAA FLIGHT SERVICE STATIONS

(In Millions)

FISCAL YEAR	FLIGHT PLANS ORIGINATED		
	IFR-DVFR	VFR	TOTAL
Historical*			
1991	4.9	1.7	6.6
1992	4.8	1.6	6.4
1993	4.7	1.5	6.2
1994	4.8	1.5	6.3
1995	4.9	1.4	6.3
1996E	5.1	1.3	6.4
Forecast			
1997	5.1	1.3	6.4
1998	5.1	1.2	6.3
1999	5.0	1.2	6.2
2000	5.0	1.2	6.2
2001	5.0	1.1	6.1
2002	5.0	1.1	6.1
2003	4.9	1.1	6.0
2004	4.9	1.1	6.0
2005	4.9	1.1	6.0
2006	4.9	1.0	5.9
2007	4.9	1.0	5.9
2008	4.9	1.0	5.9

* Source: FAA Air Traffic Activity.
Notes: Detail may not add to total because of rounding.

TABLE 44

AIRCRAFT CONTACTED

AT FAA FLIGHT SERVICE STATIONS

(In Millions)

FISCAL YEAR	USER CATEGORY				FLIGHT RULES		TOTAL
	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	IFR-DVFR	VFR	
Historical*							
1991	0.2	0.8	4.4	0.4	1.7	4.1	5.8
1992	0.2	0.8	4.1	0.4	1.7	3.8	5.5
1993	0.2	0.7	3.7	0.3	1.5	3.4	4.9
1994	0.2	0.7	3.5	0.2	1.4	3.3	4.6
1995	0.1	0.6	3.3	0.2	1.3	2.9	4.2
1996E	0.1	0.4	3.2	0.1	1.1	2.7	3.8
Forecast							
1997	0.1	0.4	3.0	0.1	1.0	2.6	3.6
1998	0.1	0.4	2.8	0.1	0.9	2.5	3.4
1999	0.1	0.3	2.8	0.1	0.9	2.4	3.3
2000	0.1	0.3	2.8	0.1	0.9	2.4	3.3
2001	0.1	0.3	2.8	0.1	0.9	2.4	3.3
2002	0.1	0.3	2.7	0.1	0.8	2.4	3.2
2003	0.1	0.3	2.7	0.1	0.8	2.4	3.2
2004	0.1	0.3	2.7	0.1	0.8	2.4	3.2
2005	0.1	0.3	2.6	0.1	0.8	2.3	3.1
2006	0.1	0.3	2.6	0.1	0.8	2.3	3.1
2007	0.1	0.3	2.6	0.1	0.8	2.3	3.1
2008	0.1	0.3	2.5	0.1	0.8	2.3	3.0

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of rounding.

TABLE 45

AUTOMATED FLIGHT SERVICES

DUATS TRANSACTIONS

(In Millions)

FISCAL YEAR	DUATS FLIGHT PLANS	DUATS TRANSACTIONS	TOTAL DUATS
Historical*			
1991	0.5	2.7	6.4
1992	0.6	3.8	8.8
1993	0.7	5.4	12.2
1994	0.7	7.3	16.0
1995	0.8	4.9	11.4
1996E	0.9	5.1	12.0
Forecast			
1997	1.0	5.3	12.6
1998	1.1	5.5	13.2
1999	1.2	5.7	13.8
2000	1.3	5.9	14.4
2001	1.4	6.1	15.0
2002	1.5	6.3	15.6
2003	1.6	6.5	16.2
2004	1.7	6.7	16.8
2005	1.8	6.8	17.2
2006	1.9	7.0	17.8
2007	2.0	7.1	18.2
2008	2.1	7.3	18.8

* Source: FAA Air Traffic Activity. DUATS began in 1990

Notes: Total DUATS services are equal to the sum of flight plans originated and transactions multiplied by two.